

1924.



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA.

by Senator Rankin

Pursuant to Statute

By Command

du return to Order

PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS.

of the Senate,
13 JUN 1924

R E P O R T

TOGETHER WITH

MINUTES OF EVIDENCE AND PLAN

RELATING TO THE PROPOSED

ESTABLISHMENT OF AIRCRAFT DEPOT,
WITH ACCESSORY SERVICES,
AT LAVERTON, VICTORIA.

Presented pursuant to Statute; ordered to be printed.

1924.

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

(Fourth Committee.)

The Honorable HENRY GREGORY, M.P., Chairman.

Senate.

Senator John Barnes,†
Senator Hartil Spencer Foll,†
Senator Patrick Joseph Lynch,†
Senator John Newland,†
Senator William Plain,†
Senator Matthew Reid,†

* Ceased to be a Member of the Senate, 30th June, 1925.

House of Representatives.

Arthur Blakley, Esq., M.P.
Robert Cook, Esq., M.P.
David Sydney Jackson, Esq., M.P.
George Higham Mackay, Esq., M.P.
James Mathews, Esq., M.P.

† Appointed 8th July, 1925.

‡ Resigned 29th June, 1925.

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COPY OF EXECUTIVE COUNCIL MINUTE No. 17.

DATED 2ND MAY, 1923.

Department of Works and Railways,
Melbourne, 2nd May, 1923.

MINUTE PAPER FOR THE EXECUTIVE COUNCIL.

Subject.—Reference to Public Works Committee.

Recommended for the approval of His Excellency the Governor-General in Council that, in accordance with the *Commonwealth Public Works Committee Act* 1913-1921, the following work be referred to the Parliamentary Standing Committee on Public Works for investigation and report thereon to the House of Representatives:—

Departmental
No. 47.
Executive
Council No. 17.
Approved in
Council.
(Signed)
Lt. Attnson,
Lt. Governor-
General.

Laverton, Victoria.—Establishment of Aircraft Depot, with accessory services.

(Signed) P. G. STEWART,
Minister of State for Works and Railways.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

PROPOSED ESTABLISHMENT OF AIRCRAFT DEPOT,
LAVERTON, VICTORIA.

R E P O R T.

The Parliamentary Standing Committee on Public Works, to which His Excellency the Governor-General in Council referred for investigation and report the proposal to establish an Aircraft Depot, with accessory services, at Laverton, Victoria, has the honour to report as follows:—

INTRODUCTORY.

1. The Australian Air Force was constituted as from 31st March, 1921, by proclamation issued under the powers contained in the *Defence Act* 1903-1918. Up to the present the following sites and buildings have been acquired for Air Force purposes:—

Point Cook, Victoria.—An area of 817 acres, acquired at a cost of £10,396, has been developed as a Central Flying School, and workshops, hangars, and quarters for officers and men have been erected.

Corio Bay, Victoria.—This site comprises 125 acres on the north-west shore of Corio Bay, and is intended for use as a base for seaplanes, flying boats, and similar craft. The area, for which £4,824 was paid, has not been developed.

Richmond, New South Wales.—An area of 175 acres, with quarters and various buildings thereon, has been purchased for £9,318, for use as an aerodrome.

Laverton, Victoria.—An area of 160 acres of land, adjoining the Melbourne-Geelong Railway, and extending to the Melbourne-Geelong-road, was acquired in September, 1921, for the sum of £3,528.

2. At the conclusion of the War the Commonwealth received from the British Government a gift of aircraft equipment valued at £1,000,000, and consisting of 128 aeroplanes of varied descriptions, together with mechanical transport, engines, stores, workshop machinery, tools, and spare parts. As storage accommodation immediately became necessary, the Air Force authorities made arrangements with the Wool Commission to utilize the wheat sheds at Spotswood as stores, at a cost of £800 per annum. Altogether, about 96 machines, with engines, motor lorries, cycles, and travelling workshops, are stored at Spotswood, the rest of the equipment at Point Cook. Of this latter portion of the gift equipment some are housed in wood and iron, and some in canvas hangars, the remainder being stacked in the open air. This arrangement has been in force about two years.

3. The present strength of the Air Force is approximately 50 officers and 300 men, the majority of whom are located at Point Cook.

PRESENT PROPOSAL.

4. The present proposal is to establish, on the Laverton site, an extensive dépôt—a warehouse of the Air Force—comprising stores, workshops, hangars, and living quarters for officers and men, with landing grounds for machines. Provision is also to be made for the training of a Service Squadron. The construction of the dépôt is to be spread over a period of four years, the various buildings to be erected during the several years to be as follow:—

First Year.

Aeroplane Stores building, 272 feet x 176 feet, estimated cost, £31,700.
 Mess room for 256 men and Sergeants' Mess, estimated cost, £5,800.
 Quarters for 40 men, two story, 69 feet x 41 feet, estimated cost, £3,120.
 Commanding Officer's house, estimated cost, £1,870.
 Married officer's house, estimated cost, £1,385.
 Married N.C.O.'s houses (two), estimated cost, £1,330 each.

Second Year.

Workshops building, 200 feet x 120 feet, estimated cost, £14,300.
 General stores building, 200 feet x 120 feet, estimated cost, £13,550.
 Quarters for sixteen men, 84 feet x 26 feet, estimated cost, £2,300.
 Quarters for 40 men, two story, 69 feet x 41 feet, estimated cost, £3,120.
 Married officers' houses (two), estimated cost, £1,385 each.
 Married N.C.O.'s houses (two), estimated cost, £1,330 each.
 Single officers' quarters, estimated cost, £6,915.

Third Year.

Hangar, 100 feet x 80 feet, estimated cost, £5,060.
 Service Transport building, 350 feet x 92 feet, estimated cost, £15,000.
 Salvage store and laundry and boiler-room, estimated cost, £2,800.
 Quarters for sixteen men, three buildings, 84 feet x 26 feet, each estimated to cost £2,300.
 Married officer's house, estimated cost, £1,385.
 Married N.C.O.'s houses (two), estimated cost, £1,330 each.
 Guard-house, 30 feet x 13 feet, estimated cost, £600.

Fourth Year.

"C" Transport building, 300 feet x 92 feet, estimated cost, £12,500.
 Quarters for sixteen men, 84 feet x 26 feet, estimated cost, £2,300.
 Quarters for forty men (two), two-story, 69 feet x 41 feet, buildings estimated to cost £3,120 each.
 Married N.C.O.'s houses (two), estimated cost, £1,330 each.
 Temporary huts for eight officers, two buildings, 81 feet x 17 feet, estimated at £545 each.
 Temporary huts for 24 men, 81 feet x 17 feet, six buildings, estimated to cost £350 each.
 Mess-rooms and kitchen for Service Squadron, estimated cost, £3,040.
 Workshops buildings (two), 80 feet x 30 feet, estimated cost, £3,500.
 Service hangars (two), 100 feet x 80 feet, estimated cost, £5,060 each.
 Service hangars with offices attached (two), estimated at £5,785 each.
 Commanding Officer's house, Service Squadron, estimated at £1,870.
 Lavatories and latrines two buildings, estimated cost, £740.

ESTIMATED COST.

5. The total estimated cost of the project, including all relative engineering services, is set down at £296,836, and is allocated over the four-year period as follows:—

| | £ | | | | | |
|-------------|----|----|----|----|----|--|
| First year | .. | .. | .. | .. | .. | 87,755 |
| Second year | .. | .. | .. | .. | .. | 109,836 |
| Third year | .. | .. | .. | .. | .. | 36,985 |
| Fourth year | .. | .. | .. | .. | .. | 62,260 |
| | | | | | | <hr style="border-top: 1px solid black;"/> |
| | | | | | | 296,836 |

DESCRIPTION OF THE WORK PROPOSED.

6. The buildings included in the dépôt scheme are proposed to be erected only on those two sides of the property which adjoin the railway line and the Point Cook-road respectively. The remainder of the area is to be graded, and cleared of stones, and reserved for future extensions of the buildings and for landing grounds for machines. A plan is attached, showing the positions which it is suggested the various structures should occupy. A railway siding, about $\frac{1}{4}$ mile in length, and estimated to cost £4,650, is to be constructed, giving direct access to the main Melbourne line, and enabling stores and equipment to be loaded and unloaded at platforms immediately in front of the main stores building.

Stores Building.

7. This building, numbered 1 on the attached plan, is part of the first year's programme, and is intended for storage of aeroplane engines, spare parts, and other equipment. It will be 272 feet long, and 176 feet wide, of brick construction, with concrete foundations and 6-in. concrete floor. The galvanized-iron roof is of saw-tooth type, and its height from floor to underside of roof is 20 feet. This height, it is claimed, will give ample space for the operation of a 5-ton travelling crane running the full length of the building, with the runways projecting over the platforms on the railway siding. Timber galleries for the storage of accessories are provided on each side of the central passage, and offices for the clerical staff at the south-east corner of the building. Fire protection is given by ample water mains and Grinnell sprinklers. The building is estimated to cost £30,000, plus £1,700 for sprinklers, and is designed to give an even temperature, low humidity, and good lighting and ventilation, all of which are required for the proper storage of aircraft material.

Workshops.

8. This building, shown as No. 2 on the plan, and included in the programme for the second year, is estimated to cost £14,300, and is designed to serve as workshops for the repair of aircraft, aero-engines, and mechanical transport. The structure is a brick one, 200 feet long, 120 feet wide, and 18 feet high, has a galvanized-iron roof, and includes provision for the following shops:—

Carpenters'.

Engine repair.

Fitting.

Sailmakers', dope and paint.

Armament.

Wireless.

Instrument repair.

Magnetic and ignition repair.

Propeller.

Rooms for drafting, photographic, and other utilities are included, and offices are provided at the south-east corner. Special features of various shops include the provision for shafting in the wood-working shop to be placed beneath the floor, and artificial heating and ventilation for the dope and propeller shops, where, owing to the strong fumes arising from the materials used, twenty changes of air per hour are to be provided. A sawdust and shavings extraction plant is to be installed, at a cost of £500, in the wood-working section, the refuse collected being used as fuel for the stove which heats the dope-room. The shops are divided by partitions of lining boards up to 3 feet, and above that by expanded metal to the roof, and are so arranged that a continuous progression of work is obtained. The workshops floor throughout will be of 3½-in. x 3-in. jarrah on 6-in. coke breeze concrete. An electrical stand-by plant, capable of taking the full workshop load, is provided for use in case of emergency.

General Store.

9. Building No. 3, also to be erected in the second year, is a brick structure of similar size and construction to the workshops building, and designed for use as general stores—for clothing, camp equipment, hospital stores, &c.—estimated cost £13,550. Good light is provided for the expert examination of equipment, while the position of the building gives easy access to road, rail, and workshops.

Erecting Hangar.

10. This building, marked No. 4 on the plan, is included in the third year's programme. It is to be 100 feet long by 80 feet wide, and 18 feet high, with 11-in. hollow brick external walls, 3 feet x 2 ft. 3 in. brick piers, and 6-in. concrete floor, steel roof trusses and wood purlins, galvanized iron roofing, and with side and end windows and skylights. Sliding doors at the front, running on a curved steel track inside the building down the side walls, are designed to make quick opening an easy matter. The total estimated cost of the hangar is £5,060.

Vehicle Store.

11. A building for the accommodation of running motor vehicles—cars, lorries, cycles, tenders—is also considered necessary. This is provided by Building No. 5, which is part of the third year's construction, and is 350 feet long, 92 feet wide, and 14 feet high. It is of brick, with

galvanized-iron roof, and 6-in. concrete floor. The north and south walls are provided with doors along their full length, and good lighting is to be given. A bowser tank, for the storage of transport spirit, is to be placed beneath the building, which is estimated to cost £15,000.

"C" Transport Store.

12. In the fourth year the Service Transport section is to be extended a further 300 feet (See Building No. 5.) The new structure is for the storage of "C" Transport, these being machines held in reserve. Each squadron of eighteen machines must have for its use fifteen lorries and eight light tenders, as well as a number of travelling workshops. The construction of the building is similar to that provided for the Service Transport, and is estimated to cost £12,500.

Salvage Store, Laundry, and Boiler-room.

13. In a dépôt such as is proposed it is stated that a certain amount of space, both building and in the open air, is necessary for salvage purposes, all obsolete and damaged machines being dealt with in this section. Provision for this purpose is made in the third year of the proposed scheme, by a building 80 feet by 30 feet, shown as No. 6 on the plan.

14. Immediately adjoining the salvage store a laundry and boiler-room, grouped as No. 7, the dimensions of which are 30 feet x 22 feet, and 22 feet x 12 feet respectively, are proposed to be erected. The walls of all these buildings will be of brick, with galvanized-iron roofs, and their total estimated cost is £2,800.

Living Quarters.

15. In addition to the foregoing—which comprise the working portion of the dépôt—provision has to be made for the housing of married and single officers and men, and for kitchens, and mess-rooms for their use. A mess-room for 256 men, and a sergeants' mess, are to be provided in the first year. These buildings, numbered 8 and 9, are of timber construction, and include kitchens, sculleries, and stores, the total estimated cost being £5,800. A two-story building, No. 16, to provide quarters for 40 single men, and to be constructed from timber at present utilized in barrack buildings at Williamstown, is estimated at £3,120, and is part of the first year's construction.

16. Similar quarters for sixteen men and 40 men respectively, and shown on the plan as Nos. 12 and 17, are to be built in the second year, and are estimated to cost, for the larger building £3,120, and for the smaller one, £2,300. A further series, Nos. 10, 11, and 13—each to accommodate sixteen men, and to cost £2,300—are allotted to third year's programme, while in the fourth year another building of the same type is to be added. In addition, further quarters for 80 men are to be provided by two two-story buildings, as previously described, at a total cost of £6,240. (Nos. 15 and 18.) In all these buildings second-hand timber from Williamstown is to be used.

17. For single officers, quarters comprising fourteen bed-rooms, billiard-room, reading-room, dining-room, and kitchen, are to be constructed in the second year, at an estimated cost of £6,915. (No. 26.)

18. The Commanding Officer's house, No. 20, set down at £1,870, is part of the first year's programme, as also a married officer's house, No. 21, at £1,380, and two houses for married N.C.O.'s, at £1,330 each, Nos. 27 and 28. In the second year four more houses—two for married officers, Nos. 22 and 23, and two for N.C.O.'s, Nos. 29 and 30—of the same type, and at the same estimated cost, are scheduled, while the third year's programme includes another officer's house, No. 24, and two more for N.C.O.'s, Nos. 31 and 32. Buildings Nos. 33 and 34, at £1,330 each, are allotted for fourth year construction for N.C.O.'s, and a guard-house, No. 19, estimated at £500, is also to be provided. All these buildings are proposed to be constructed of timber, with galvanized-iron roofs.

Accommodation for Service Squadron.

19. In addition, provision is to be made at the proposed dépôt for the accommodation of a Service Squadron, i.e., units of the Citizen Air Force, which will carry out training at Laverton. The buildings comprised in this section are mostly of a temporary nature. They include two temporary huts for officers, Nos. 35 and 36, the cost of which is estimated at £545 each; Nos. 37 to 42, six temporary huts, each for 24 men, and estimated to cost, at £350 each, £2,100. These eight buildings will be removed from Point Cook, and re-erected at Laverton. A mess-room and kitchen, No. 43, to cost £3,040, is also included, and two workshops, Nos. 44 and 45, each 80 feet x 30 feet, with brick walls and concrete floor, jarrah covered, are estimated at £1,750 each. There are also provided four service hangars, Nos. 46 to 49, each 100 feet by 80 feet, of similar construction to Building No. 4 in the main dépôt. The estimated cost of two of these hangars is £5,060 each; the remaining two, which are designed with offices attached, are set down at £5,785 each.

20. The usual lavatory and latrine accommodation is provided at a cost of £740.

21. A house similar to that provided for the Commanding Officer of the dépôt, and numbered 51, is to be provided for the Officer Commanding the Service Squadron, who will be a permanent officer located at Laverton. Its estimated cost is £1,870.

Engineering Services.

22. The engineering services of the dépôt are estimated to cost £114,351, divided as follows—Civil engineering, £85,791; mechanical, £14,600; electrical, £13,960. The whole of the expenditure on civil engineering is to be incurred in the first two years, and in the case of the mechanical and electrical services, the bulk of the work will be performed in the same period, leaving only extensions for the last two years.

Water Supply.

23. The civil engineering proposals involve the taking up of the existing 4-in. water main from Newport to Laverton, and replacing it with a 6-in. main, the portion taken up being relaid from Laverton to Point Cook, to improve the Flying School's supply. This proposal is estimated to cost £26,800. To insure an efficient water supply two 50,000-gallon reinforced concrete tanks, raised on stands to a height of 40 feet above the ground are to be built at Laverton at an estimated cost of £3,400, and one of these will be used wholly for domestic purposes. The other will be kept full for use in case of fire, and a good pressure of water assured by electrically-driven Booster pumps, installed at a cost of £1,840, in the 9-in. main taking off from the tank. Provision is made for eighteen pillar hydrants, at intervals of 100 yards, to be installed throughout the dépôt. These provisions bring the total estimated cost of the water supply to £36,500.

Sewerage.

24. Provision has been made for a water-borne system, in which the sewage is collected by means of the ordinary reticulation and conveyed through 6-in. and 9-in. pipes to a pump-pit. From this pit the sewage is discharged by means of an electrically-driven pump, through a 6-in. cast-iron main into the Board of Works' outfall sewer, $\frac{1}{4}$ miles away. Permission to do this has been granted by the Board of Works conditionally upon the Commonwealth paying a charge of about £75 per annum. The estimated cost of the system is set down at £15,120.

Roads.

25. Concrete roads, varying from a width of 20 feet between the transport sheds and hangars to one of 70 feet in front of the hangars, are to be laid down, and built to withstand heavier traffic in the vicinity of the workshops. The total estimated cost of the road-making is stated at £16,743, while footpaths 6 feet wide throughout the dépôt are estimated to cost £1,800.

Fencing.

26. A wire fence around the dépôt, and, in addition, a high galvanized-iron fence, enclosing the stores' and workshops' block, are to be constructed at an estimated cost of £2,087, while kerbing, channelling, and storm-water disposal are expected to cost a further £3,606.

Mechanical Engineering.

27. Mechanical engineering services include the installation of the 5-ton travelling crane in the stores, at a cost of £3,900; the heating and ventilating system in the dope shops, £1,200; the installation of machinery in the workshops, £2,100; and refuse extraction plant, as previously mentioned, £500. Laundry equipment is estimated at £1,550. Steam-cooking plants are to be provided in the three kitchens—that in the officers' quarters costing £900, and those of the men's mess and Service Squadron £1,000 each; £1,000 is set down as the probable cost of the hot-water supply to the men's quarters, while similar facilities are estimated to cost £200 for officers' quarters, and £650 for the Service Squadron.

Electric Supply.

28. The present system of electric supply to Point Cook involves the maintenance of 12 miles of high-tension mains, extending from the railway sub-station at Newport; but as the Electricity Commission's mains cross the Geelong-road about 5 miles from Laverton, it is now proposed that the existing mains shall be handed over, at a valuation, to that body, which will supply the necessary current.

The provision of an electric sub-station at Laverton is estimated to cost £2,800, and sub-mains therefrom to the various buildings another £1,800. Light and power installations for the dépôt buildings are expected to cost £6,620. They include equipment for industrial general

lighting, with hand-lamps for local inspection purposes, in workshops, hangars, and stores; six motors to drive the workshops' shafting, and power points for portable machine tools; while offices and quarters are provided with ordinary direct lighting and power points for radiators.

Fire Alarms.

29. The fire-alarm system, and the provision of a watchman's clock, which, with the alarms, is to be connected to the guard-room, is estimated to cost £300. The system and lay-out of water mains and hydrants have received the approval of the Metropolitan Fire Brigades' Board.

COMMITTEE'S INVESTIGATIONS AND RECOMMENDATIONS.

30. The Committee visited Laverton, and inspected the site of the proposed dépôt; examined the material stored in the wheat sheds at Spotswood, and also that stored, and in use, at Point Cook. Evidence was obtained from the Acting Chief of the General Military Staff, a representative of the Naval Board, the principal officers of the Air Force, and also from architects, engineers, and commercial men engaged in aviation work. The plans and estimates of the scheme were subjected to close scrutiny, and light obtained on every side of the extensive project.

In evidence given before the Committee the fact was emphasized that an Air Force without dépôts of the type proposed is in a similar predicament to an army without ordnance and mobilization stores, or a navy without dockyards, victualling yards, and workshops. After careful examination of all the facts, the Committee is convinced that the necessity exists for the establishment of an Aircraft Dépôt of the nature proposed, as being an essential factor in insuring the proper development of the Royal Australian Air Force for the defence of Australia. According to evidence tendered, more than one such dépôt will be eventually required, but present needs and those of the immediate future will be satisfied by the fulfilment of the scheme proposed.

Site.

31. The proposed site at Laverton, at a convenient distance from the Point Cook Central Flying School and the Corio Bay Base, and possessing good road and rail communication with Melbourne, has distinct advantages from the point of view of accessibility, while those qualified to judge assured the Committee that it has no strategic disadvantages, and the nature of the country makes it admirably adapted for flying purposes.

The Committee ascertained, however, that the State Government has had under consideration the question of the reservation of areas in this locality for noxious trades, and fears were expressed that the proximity of certain noxious trades might be inimical to the health and comfort of those employed at the Dépôt. The State Government was therefore approached in an endeavour to obtain an assurance that such trades would not be permitted within a radius of 3 miles of the Aircraft Dépôt. As the State Government was unable to accede to this request, efforts were made to obtain an equally suitable site in another locality.

The Defence Department suggested an alternative site in the vicinity of Hopper's Hill, about 3 miles nearer Werribee than the site originally selected. This was reported to be suitable for flying purposes and convenient from the point of view of access by road and rail, but likely to involve additional expense in respect of the following:—

| | | | | |
|---|----|----|----|-----------------------------|
| Acquisition of land | .. | .. | .. | £5,000 |
| Covering and filling in irrigation channel | .. | .. | .. | 3,000 |
| Extension of water mains | .. | .. | .. | 10,000 |
| Extension of electric light mains | .. | .. | .. | 2,500 |
| <i>Less reduction in length of sewerage mains</i> | .. | .. | .. | £20,500 1,500 £19,000 |

The Committee having inspected this area and taken evidence in regard to it was of opinion that the additional expense involved might be even more than set out above.

The Victorian Health Commission was then asked to state whether any of the trades to be established on the area adjoining the Laverton site would be likely to be inimical to health. A reply was received from the Commission on 26th May, in the following terms:—

"In reply to your letter of 12th instant, I have to state that if it be assumed that offensive trades premises will be established on the reserved area immediately north of the Aerodrome Site, it is probable that the occupants of such site will from time to time be subjected to offensive fumes from such premises, but it cannot be definitely stated that the effect of the fumes would be prejudicial to health. It may be added that the quality of utilizing the reserved area for offensive trade establishments is very much 'in the air' at present, and in any case a special Act of Parliament would be necessary before it could be so used."

Mr. Cobb's evidence was based on the assumption that the cattle yards would be in the vicinity of Laverton Station. It is not known where the yards will be situated. It is believed that the Railway Department prefers a site not far from Sunshine. On inquiry this Department stated that by the Railway Department their site had been selected so far, but that in all probability it would be somewhere in this area between Sunnyside and Laverton. As the end of the year will draw near, the Aerodrome Site will be selected, if it will be readily seen that it is not practicable to state definitely how the Aerodrome Site will be affected. It is probable that the offensive trades to be established will be limited to those related to abattoirs. Another point to note is that as the land slopes from the sewer towards the south it is probable that, in order to secure gravity drainage, offensive trade premises will be situated to the north of the sewer. If this be so, there will be a considerable zone between the sewer and the Aerodrome.

"In regard to dangerous trades, it is improbable that they will be relegated to the Offensive Trade Reserve. Chemical Manure Trade Establishments to be economically situated may be situated that the raw material can be delivered by vessel direct to the factory; otherwise they could not compete with establishments which have this advantage. Arsenic recovery premises need to be established either near where the raw material is available or near a port.

Under these circumstances, Dangerous Trade Premises liable to emit noxious fumes are not likely to be located on the Laverton Offensive Trade Area."

In view of all the circumstances surrounding the case, the Committee therefore recommends that the site originally selected at Laverton be utilized.

Air Force Development.

32. While the Committee is of opinion that an aircraft dépôt such as it is proposed to establish on the Laverton site will meet all normal needs for the present and immediate future, it considers that as soon as possible after the Imperial Conference a definite policy should be formulated for the development of the Air Force by progressive uninterrupted stages on sound lines to the minimum point considered essential for the safety of the Commonwealth, and the Australian public made aware of what has to be faced in the matter of expenditure.

Period of Construction.

33. Various witnesses expressed the opinion that it was highly desirable that the dépôt should be constructed as soon as possible, instead of being spread over a period of four years as proposed. It was pointed out that, while the machines and materials in store require considerable overhauling, the workshops enabling this to be done are not to be commenced until the second year, and that until the full programme is completed Australia's air defence will be of comparatively small avail.

34. During the inspection of the material at Spotswood and Point Cook it became obvious that the stores were suffering unnecessary depreciation. At Spotswood members of the Committee entered and inspected large cases—weighing up to 3 tons, and measuring up to 25 feet in length and 7 feet in height containing valuable aeroplanes and parts. These had been stacked by mere sheds, which necessitated re-covering in places, in order to make them weather proof. At Point Cook other valuable machines were shown to be kept in canvas hangars, which were not only liable to carry away in a strong wind, but were also the cause of deterioration to the wing fabric of the planes, by reason of the lack of proper ventilation and the excessive heat. The consequent danger to the men who fly the machines, and the expense of replacing the wings (a small wing costs £50) were factors in proving that proper storage accommodation should be provided immediately. Again, many thousands of pounds' worth of stores of all kinds were seen packed in other canvas hangars; with no means of keeping them under lock and key, and each item has to be accounted for to the Auditor-General. If any further proof of the necessity for proper storage accommodation were required, it was given by the sight of 2,000 gallons of oil, in small drums, standing uncovered in the open air, the state of the ground near by showing clear evidence of the resultant loss.

35. Under these circumstances, the Committee is convinced that in the interests of economy and efficiency, every endeavour should be made to push on with the work as expeditiously as possible.

Treatment of Personnel.

36. The question of the treatment of Air Force personnel also came before the Committee. It was stated in evidence that over 50 per cent. of the men are married, and are either compelled to live in single quarters at Point Cook, or to travel to and from Melbourne, at considerable cost, and it must be remembered that the hours of duty at Point Cook, which is 5 miles from the railway, are from 7.45 a.m. to 5.15 p.m. In these circumstances, some skilled mechanics, whom the Force can ill afford to spare, have purchased or are endeavouring to purchase their discharges. An early transfer to Laverton will do a great deal towards minimizing loss from this cause.

Engineering Services.

37. *Railway Siding.*—The Committee agrees with the position selected for the location of the railway siding, and the arrangements in respect of same. In the opinion of members action should be taken without delay to have this siding completed as early as possible, in order to admit of its use for the transport of materials employed in the construction of the dépôt.

38. *Water Supply.*—The Committee agrees with the proposal submitted. Every provision appears to have been made to meet domestic and other needs, and to have available an adequate supply in the event of fire.

39. *Light and Power.*—The proposal to obtain electric current from the system of the Victorian Electricity Commission appears to be satisfactory and economical, and is concurred with. The suggestion to install also a stand-by plant, capable of taking the full workshop load in cases of emergency commanded itself to the Committee.

40. *Sewerage.*—The installation of an adequate sewerage system at this dépôt is of material importance, and the Committee considers that the difficulties associated with an establishment of this nature on a low-lying area have been satisfactorily overcome. The expense, however, appears high, and the Committee recommends that every endeavour should be made to reduce costs as much as possible.

41. *Roads, Footpaths, and Fencing.*—The proposals advanced in respect of these items appear to be satisfactory, and are agreed to.

42. *Depôt Buildings.*—On the evidence placed before it, the Committee is satisfied that the various buildings proposed have been carefully designed to meet the purposes for which they are intended. In view, however, of the existence of stone quarries and crushing plant adjacent to the railway, and at no great distance from Laverton, the Committee is of opinion that it should be possible to construct a number of the larger buildings more satisfactorily and cheaply of reinforced concrete. It is, therefore, recommended that careful attention be given to this matter, with a view to adopting reinforced concrete if it be found that it can be utilized at a lower cost than the estimates submitted for brick buildings.

Houses for Officers and N.C.O.'s.

43. The cost of the three types of houses to be erected at Laverton, viz., Commanding Officer's house, £1,870; married officer's house, £1,380; and married N.C.O.'s house, £1,330, appears to the Committee to be very excessive, considering the ordinary construction proposed. The detail construction of the smallest type, of which eight are proposed, at a cost of £1,330 each, is as follows:—

Timber frame and hardwood weatherboard construction, galvanized corrugated iron roof, 10-ft. ceilings. Inside walls and ceilings plastered. Four rooms—Living room, 17 feet x 14 feet; bedroom, 17 feet x 12 feet; bedroom, 11 feet x 10 feet; kitchen, 15 feet x 12 feet; and bathroom, 6 feet x 7 ft. 6 in.; with wash-house. Front verandah 8 feet wide; electric lighting, sewerage, garden paths, and fencing.

44. Evidence obtained from the Chief Architect, State Savings Bank of Victoria, and inspection of groups of houses erected by that institution, convinced the Committee that the cost of the houses could be materially reduced without affecting their stability, despite departmental evidence to the effect that houses of the same type at present being erected by contract at Point Cook are costing £1,820. The Committee inspected cottages being erected at Coburg by the State Savings Bank for returned soldiers, and found that four-roomed houses were being erected at costs varying from £250 to £275, or approximately £60 per square, plus the cost of the land. The details of Type 9, having five rooms, and costing £675, are as follow:—

Timber frame and softwood weatherboard construction, tile roof, 10-ft. ceilings. Inside walls and ceilings plastered. Living room, 14 feet x 12 feet; bedroom, 13 feet x 12 ft. 6 in.; bedroom, 12 ft. 6 in. x 11 feet; breakfast room, 12 ft. 6 in. x 10 feet; kitchen, 12 ft. 6 in. x 9 feet; also bathroom, 7 feet x 5 feet; wash-house, 7 ft. 6 in. x 5 feet; hall, pantry, verandah, W.C., and porch, with electric light, gas, water, and fencing.

It must be admitted that, while the construction of this type is substantial, it is inferior in standard to the specification of the Commonwealth Department of Works and Railways, and naturally cheaper. The difference in cost, however, is startling.

45. On representations being made to the Department of Works and Railways by the Committee, amended figures were supplied, reducing the estimated cost of the proposed dwellings from £87 and upwards per square to £70 per square, plus 15 per cent. to cover additional cost of erecting at Laverton, or £80 10s. per square in all.

46. The Committee believes that with the deposits of good stone and crushing plants available so close to the dépôt it is possible that concrete houses could be erected at but little greater cost than timber dwellings, and as the cost of upkeep would be considerably less, it recommends that tenders be called for these cottages in reinforced concrete or brick, and if the prices are within 12½ per cent. of the revised estimate of the cost of timber houses, then the more permanent structures be erected.

47. It further recommends that, to obtain true competition, tenders should be invited, either singly or in groups, for the construction of the whole of the dwellings proposed for the dépôt. This would enable small contractors, whose usual work is the building of such houses, to compete, thus doing away with the need for relying on the type of contractor with a large plant and organization, who would necessarily undertake the construction of the extensive stores, workshops, and hangars.

48. During the examination of the Chief Architect, Department of Works and Railways, it was stated that Baltic weatherboards were proposed to be used in the construction of the houses. After discussion, the Chief Architect gave the Committee his assurance that, if the houses are erected in timber, hardwood weatherboards will be used in preference to Baltic.

Housing for Men.

49. In the plans for the dépôt no provision is made for married quarters for other than officers and N.C.O.'s. This appears to the Committee an anomaly, as it is hardly to be expected that the best type of mechanic will be attracted to join the Royal Australian Air Force if he has to travel to and from Laverton daily. The Committee, therefore, recommends that consideration be given to the possibility of providing suitable accommodation for married men engaged in skilled work at the dépôt.

50. In addition, the Committee considers that the establishment should be made more attractive by the erection of a recreation hall, in which billiards and a small library should be provided.

Manufacture of Aircraft in Australia.

51. Evidence given before the Committee concerning the manufacture of aircraft in Australia showed that this industry deserves great attention. The air defence of Australia will be of small value while it is essential to import fresh supplies of aeroplanes, engines, and parts from other countries, communication with which may possibly be cut off. Great advances have been made in types of aero engines, and, if the best of these were selected, it should be a good investment, from a defence point of view, for the Government either to manufacture the engines in its own factories, or grant a subsidy to private manufacturers to do so.

Improvements.

52. Inquiries made by the Committee revealed that, as the galvanized-iron roofs and external walls of that material would not be painted, according to the scheme proposed, the dépôt would necessarily present a somewhat bare appearance. The Committee is of opinion that, to assist in keeping the buildings cool in hot weather, as well as to add to their durability and appearance, these roofs and walls should be treated with a solution of boiled linseed oil and Portland cement. It is further of opinion that a suitable system of tree-planting, in approved locations, would be an improvement to the dépôt, and recommends accordingly.

SUMMARY OF RECOMMENDATIONS.

53. Briefly summarized, the recommendations of the Committee are as follow:—
 - (i) That an aircraft dépôt is essential for the proper development of the Royal Australian Air Force (page viii).
 - (ii) That from the points of view of contiguity to Point Cook, and accessibility by road and rail, the site may be considered suitable (page viii).
 - (iii) That, as soon as possible after the Imperial Conference, a definite policy for the progression of air activities for the defence of Australia be formulated, and the Australian public made aware of what has to be faced in the matter of expenditure (page ix).
 - (iv) That the construction of the dépôt be proceeded with as expeditiously as possible (page ix).

- (v) That the railway siding be constructed without delay, to admit of its use for the transport of material employed in the erection of the dépôt (page ix).
- (vi) That endeavour should be made to reduce sewerage costs as much as possible (page ix).
- (vii) That dépôt buildings be erected in concrete (page x).
- (viii) That tenders be called for cottages in reinforced concrete or brick, and if prices are within 12½ per cent. of the revised estimate of the costs of timber buildings, then the more permanent structures be erected (page xi).
- (ix) That tenders for the construction of the whole of the dwellings be invited either singly or in groups (page x).
- (x) That consideration be given to the possibility of providing housing accommodation for married mechanics employed in skilled work at the dépôt (page xi).
- (xi) That a recreation hall, with billiards and a small library, be provided for the men (page xi).
- (xii) That the Government should take steps either to manufacture aeroplanes complete with engines in its own factories, or encourage private manufacturers to do so, by means of a subsidy (page xi).
- (xiii) That all roofs and external walls of galvanized iron be treated with a solution of boiled linseed oil and Portland cement, in order to add to their durability, appearance, and coolness (page xi).
- (xiv) That a suitable system of tree-planting, in approved locations, be adopted at the dépôt (page xi).

H. Gregory
H. GREGORY,
Chairman.

Office of the
Parliamentary Standing Committee on Public Works,
Federal Parliament House, Melbourne,
15th November, 1923.
127 MAY 1924

MINUTES OF EVIDENCE.

(Taken at Melbourne.)

FRIDAY, 24TH AUGUST, 1923.

Present:

| | |
|------------------------------|--------------|
| Senator Lynch, in the Chair; | |
| Senator Barnes | Mr. Jackson |
| Senator Reid | Mr. Mackay |
| Mr. Blakely | Mr. Mathews. |
| Mr. Cook | |

Wing-Commander Stanley James Goble, D.S.O., O.B.E.,
D.S.C., Chief of the Air Staff, sworn and
examined.

1. *To Senator Lynch.*—I have been sixteen years in the Service, State and Commonwealth, eight years in the Air Forces. I have had prepared for the Committee the following statement relating to the establishment of an aircraft dépôt at Laverton, Victoria.—

Under cover of a report dated 7th February, 1920, the Air Board forwarded to the Minister of State for Defence a statement dealing with the policy of the Air Corps (now the Royal Australian Air Force).

This policy governed the future expansion of the Air Corps based on the requirements of the Navy and the Army, and the Air Corps requirements common to both of these services.

The full programme was recommended to be developed over a period of five years, and the Air Board, in their report, together with the estimated cost of giving effect thereto during each of the six years, was duly set down.

The Air Board, realizing that the expansion of an Air Force would be dependent on the provision and distribution of the necessary equipment, provided under the programme for a "Temporary Establishment of an Aircraft Dépôt in Victoria." Consideration will have to be given later to the establishment of an aircraft dépôt in New South Wales, and possibly aircraft parks (subsidiary aircraft depôts) in other States, but the creation of further depôts (including one for mobilization equipment) will be governed by the policy of expansion of the Air Force.

It is desired in this memorandum to place before the Committee the necessity for an aircraft dépôt in Victoria. An area of 160 acres of land was acquired for this purpose at Laverton in September, 1921. (See Commonwealth Gazette No. 78, dated 20th October, 1921.)

The desirability of establishing an aircraft dépôt at Laverton, in preference to Point Cook, was dealt with by your Committee in 1922. (See Report Parliamentary Committee of Public Works dated 10th October, 1922.)

REASON FOR ESTABLISHING AN AIRCRAFT DéPÔT.

An Air Force aircraft dépôt is designed for the following purposes:—

- (a) A store for the housing of mobilization equipment, and for the storage of all reserve working equipment for training purposes in peace time.
- (b) A receiving depot for all stores received from overseas and local contractors.
- (c) A distributing store for distributing equipment to units and parks of the Air Force.
- (d) A workshop for all types of aircraft, aero-engines, mechanical transport, machine guns, wireless telegraphy, photographic, &c., repairs are carried out, where such repairs are beyond the capacity of Units.
- (e) A provisioning dépôt in which provision is made and stores and equipment for Air Force purposes.

An Air Force dépôt in comparison with similar organizations of the other services can best be compared with the Naval Dockyards, Victualling Yards and workshops for Naval purposes, and Army Ordnance and Mobilization stores, and workshops for military purposes.

It must be remembered that it is an accepted principle in both the services referred to, that Naval Dockyards, Ordnance stores, and workshops are required for the receipt, storage, distribution, and repair of equipment.

In the Navy and Army Services, owing to the fact that these services have been established for many years, large Ordnance Stores and Naval Dockyards are in existence, but, as the Air Force is comparatively a much more recently established service, no permanent provision for the same has yet been made by the Commonwealth of Australia for Air Force requirements in this direction, and the establishment of an aircraft dépôt practically governs any extension of the Air Force activities.

It should also be understood that an aircraft dépôt is necessary to meet current needs, as much valuable equipment is now housed in hessian (temporary canvas hangars), which are intended solely for service purposes where units may be established in isolated places, and such canvas hangars are not intended on or at all suitable or economical for permanent stores.

It is absolutely impossible to carry out economically any extension of the Air Force without proper facilities for storage, distribution, repair, and accounting of the equipment and stores.

ORGANIZATION OF EQUIPMENT SERVICES.

As previously stated, aircraft depôts are the receiving units for all equipment received in bulk from all sources.

Aircraft parks, which are really subsidiary aircraft depôts, will be established as required near the scene of any operation in which aircraft are used. These depôts or depôts will be a number of units that may be established there in peace time.

Aircraft parks are subsidiary distributing units to the aircraft depôts, and distribute only to units, and normally will not be receiving units from Contractors, but will only receive from aircraft depôts.

In time of peace, depôts and parks must be organized in such a way that the equipment is handled and accounted for with the minimum of staff, but with an organization, which, in case of emergency, is capable of rapid expansion.

DEPOT ORGANIZATION.

The organization of an aircraft dépôt should embrace the following:—

Stores.—Receipt, checking and distribution of stores to their respective groups, according to their classification.

Storage in bulk of all items in everyday use by units, both fixed and mobile, including receiving, issuing, and returning stores on a scale sufficient to conform to the policy of the period.

Distribution, in the quantities required, to all units authorized to demand from the dépôt, of such items for which provision is made on their establishment.

Salvage, where all assemblies can be disassembled, examined, repaired, modified, or reduced to serviceable parts for reuse or to scrap for disposal.

Workshops.—Aircraft Repair Section, where all aeroplanes and seaplanes requiring complete overhaul and a considerable amount of repair work can be dealt with.

Engine Repair Section, where the most extensive overhauls are carried out, including the dismantling, cleaning, and calibrating of all instruments used on aircraft.

Mechanical Transport Repair Section, where all complete overhauls of chassis and bodywork can be carried out.

Instrument Repair Section, where the limited personnel employed on this class of work can be centralized and equipped with the necessary apparatus for testing and calibrating the various instruments used on aircraft.

Wireless Repair Section.—The remarks on instruments apply generally to this section also.

Photographic Repair Section.—The remarks on Instruments apply generally to this section also.

Armament Section, where all machine guns, synchronizing gears, sights, &c., can be overhauled, tested, and turned up on a suitable range prior to issue, and where repairs requiring special tools can be carried out.

Fabric, recovering, and Doping Shop, where fabric parts required for dopes can be dealt with and unserviceable parts reconditioned in the specially constructed buildings necessary to preserve the health of persons employed on this class of work.

Accounts.—Accounting Section, where the whole of the accounts for every item of Air Force equipment on charge to units served by the dépôt are kept.

Training—Training Centre.—As the knowledge necessary for the correct method of storage of equipment is only obtained after considerable actual practical experience of the work, an aircraft depot provides the means of training personnel for this work.

SELECTION OF SITE.

Experience has proved that the storage of large quantities of Air Force equipment on the seashore (irrespective of class of building used as a store) should be avoided wherever possible.

At present, the aircraft material in our possession is housed partly in permanent hangars at Point Cook, partly in temporary buildings at Spotswood (the cost of which is over £200 per annum), and partly in temporary canvas hangars at Point Cook. The use of permanent hangars for stores has been recommended, but not adopted.

The practice of using hangars (which have been erected for the storage of aircraft) for the storage of small stores is unacceptable.

The cost of providing a hangar for housing aircraft is much greater than the cost of providing a building of equal area for stores.

For example, the hangars at Point Cook at present holding small stores cost £10,000, and a building of equal area designed for stores purposes would cost only £9,000.

The additional cost of the hangars for aircraft can be attributed to the greater span, increased height, and cost of sliding doors, and also because there are no pillars to obstruct.

The prolonged use of canvas hangars as a substitute for permanent buildings is not economical, and as previously stated, such canvas hangars are not intended for permanent storage, but are designed for service purposes where units may have to move frequently, and it is essential that permanent buildings be provided for the storage of aircraft equipment to be erected as soon as possible.

Further, no depot can function satisfactorily at any time unless stores and equipment can be removed from the railway trucks and distributed to their proper location with the least possible interference with the rapid re-erection and deployment of equipment without damage to stores very largely by this factor. Any scheme involving intermediate road transport is to be deprecated on account of the increased cost, and the greater risk of damage to stores when the double handling entails.

An aircraft depot and its attendant workshops should not be part of a general training establishment, because the output of workshops is dependent on a routine that cannot economically be adopted at a general training centre. Such workshops constitute a very important part of the internal economy of an Air Force, and no adequate substitute for such workshops exists in the Commonwealth at present.

It is recommended that the training and control of R.A.A.F. Units, is facilitated by concentration within reason, and naturally, when considering the location of an aircraft depot, that first thought of was Point Cook, where we already own over 640 acres of land, and where (although portion of this area may be required as an aerial gunnery and bombing practice area) there would still be room for a depot if area and present needs alone were considered.

Consideration was, however, given to—

- (a) Increased activities in time of war, and possible requirements for expansion in times of peace and war.
- (b) Mobilization and maintenance of service units in time of war.
- (c) Maintenance and operations of service units and the desirability of such interfering as little as possible with training units whose activities also are largely increased in war.
- (d) Possible sites of additional service units (e.g., Flying Boats and Torpedo-Carrying aircraft).

All these questions indicated Laverton as being preferable to Point Cook as the site for an aircraft depot, but in addition, consideration of cost of establishment and of maintenance are still in favour of Laverton.

It is proposed, therefore, that an aircraft depot be established in permanent buildings at Laverton where the necessary land has already been acquired.

As has been pointed out in the foregoing, an aircraft depot is to be main receiving, repairing, and distributing centre for the Air Force. This being so, certain requirements are essential.

Good communication by road and rail—Trains could run from the proposed depot site itself via the main Melbourne-Geelong line, and thus to any part of Australia. The Flying Boat and Torpedo-Carrying aircraft main site at Corio Bay is on the Laverton-Geelong line. The Laverton-Geelong road is 16 miles from Point Cook by road, and the property abuts on to the Melbourne-Geelong road which is one of the finest about Melbourne.

2. Adequate facilities for economic handling of Stores—As the property faces the railway line, adequate facilities are available for quick and economic handling, while any expansion possible owing to the nature of the neighbouring properties.

3. An aerodrome to allow of flying tests, and receipt and despatch of aircraft by air—The surface area, and surrounding country are suitable for the proper testing and despatch of aircraft.

A few of the advantages of the establishment of the permanent depot at Laverton in preference to Point Cook are summarized as follows—

- (1) Laverton is on a good main road and main railway line maintained for civil needs, and on the road to the other R.A.A.F. Flying Station (Point Cook), and to the best water on Port Phillip Bay for flying boats, torpedo work, &c. (Corio Bay).
- (2) Laverton is well provided with roads, and is situated near Point Cook for the operations of service units manned with Citizen Forces, and would allow of mobilization and maintenance in time of war without interference with training activities at Point Cook. The small amount of continuous training (several days per year) which will be carried out by the Citizen Air Force will not interfere with the depot activities.
- (3) Telephone, water, light and power mains erected by the Commonwealth pass through Laverton.
- (4) A magazine area suitable for the storage of R.A.A.F. stores is connected to Laverton by light railway.
- (5) The saving in original cost and in upkeep is considerable.

With the Laverton site in view, the Department of Works and Railways prepared estimates to compare the cost of establishing the depot there as against establishing it at Point Cook. The following table shows such an estimate necessary for each site, in excess of the amount common to both.

Additional cost by reason of erecting buildings, &c., at Point Cook, based on a total tonnage of material used in erection of buildings of 10,000 tons.

| | £ s. d. |
|--|------------|
| Cartage of material to Point Cook, say, 10,000 tons, by steam tractors and trolleys, estimating 9d. per ton per mile, or 4s. 0d. per ton delivered | 2,225 0 0 |
| Cartage of material to supervision | 1,000 0 0 |
| Shunting of material on roads or overhead line to storeyards | 1,000 0 0 |
| Storeyard at Laverton consisting of rented land, fencing, and shed | 175 0 0 |
| Labour in storeyard—loading and unloading | 350 0 0 |
| Loopline from station to storeyard | 500 0 0 |
| Indirect cost of steam tractor, trolley, &c. | 2,000 0 0 |
| Supplementary water supply, 6 miles, 4-inch main | 12,000 0 0 |
| | £10,750 |

| | £ s. d. |
|---|------------|
| Land and compensation | 2,300 0 0 |
| Fencing, cattle grids and occupation crossings | 1,030 0 0 |
| Earthworks | 4,312 10 0 |
| Bridge—steel and concrete bridge over Skeleton Creek | 4,860 0 0 |
| Minor water ways complete | 575 0 0 |
| Ballast and metalizing | 550 0 0 |
| Sleepers | 3,450 0 0 |
| Telegraph line, complete | 345 0 0 |
| Station buildings, platform, &c. | 300 0 0 |
| Signalling and interlocking, Laverton | 400 0 0 |
| Planting and maintenance in road 12 miles | 10 0 0 |
| Plant and supervision, 12½ per cent. | 4,841 0 0 |
| Contingencies, 10 per cent. | 4,357 0 0 |
| | £44,023 |

| | £ s. d. |
|--|-------------|
| Acquisition of site | 3,028 0 0 |
| Branch electric power main, new transformer house, transformers, &c. | 1,000 0 0 |
| Cartage of materials from Laverton railway station to site at Laverton station, average site with half a mile of station, 10,000 tons | 3s. per ton |
| Labour, loading and unloading at station | 1,600 0 0 |
| | £500 |
| | £57,033 |

CONSIDERATIONS GOVERNING LAY-OUT OF DEPOT.

The general lay-out of the depot and living quarters has been governed by—

- (1) Placing the living quarters as near the Laverton railway station as possible.
- (2) Arranging the store depot, &c., where the railway facilities can be availed of without the siding encroaching on our land.
- (3) Allowing for expansion of depot.
- (4) Reserving the most suitable ground for the use of landplanes.

The living quarters, by retaining their proposed situation, are in the most convenient position, close to a毛alled road, and the shortest possible distance from the railway station. The allowance for expansion in this section is not great, but is thought sufficient to meet all reasonable requirements for single quarters. If mobilization occurred, land could probably be secured across the railway line without interfering with the aerodrome.

Care has been exercised in recommending the number of single quarters to be erected, as approximately 60 per cent. of the personnel enlisted are married, but as extra personnel will have to be enlisted to run the depot, it is reasonable to assume that the greater proportion of these will be single men.

DETAIL LAY-OUT.

The detail lay-out of the depot has been governed by the following conditions—

- (1) Railway siding to remain in railway side width, thus saving our own area.
- (2) Minimum area to house the existing material and workshops.
- (3) Buildings grouped for the utmost economy and convenience.
- (4) Buildings so placed that any extension could be made in time of war so that the existing buildings would not be interfered with, and on completion a general rearrangement would not be necessary.

If war should break out, this depot would have to handle a large amount of stores and equipment for the defence of the present area, and will be capable of handling the necessary traffic. Therefore, if any expansion on a big scale took place, the siding would take up a considerable area, and it is not desirable that this should be deducted from our aerodrome. By the present proposal this expansion would all occur on the railway side-width in which there is ample room.

The areas of the buildings and yards have been kept down to the minimum, and will have material actually in storage, and a small amount which, in accordance with the Air Force policy, is thought essential to purchase immediately.

A schedule of areas proposed for the depot compared with the areas adopted by the Royal Air Force in England for one Squadron shows that the space allowed is very much below the R.A.F. areas.

Our requirements are shown to be considerably below the Imperial figures, but this is accounted for by the fact that the area required for the accommodation of the fact that the design as mentioned in another paragraph—is very flexible, and any increase desired in the future can be made with a minimum amount of readjustments of the various departments.

GEOPING OF EQUIPMENT AND STORES.

Owing to the very large variety of equipment and stores held by the Royal Australian Air Force, all stores of a similar nature have been classified in the same stores group. This facilitates stockkeeping, accounting, and tends to greater accuracy in all stores.

Group "D"—Contains all aircraft and aircraft spare parts. In Group "A" there are several sections, these sections being the various types of machines, and the parts for same.

Group "D"—Contains all aero engine and parts, and each section of that group contains one type of aero engine and the parts for same.

The following is a detail of the amount of space estimated to be required for each group for the equipment now in our possession—

GROUP "A"—AIRCRAFT AND PARTS.

The total area required to store the machines and spares that will be in the aero static depot after the equipment is allotted to one (1) Squadron, one (1) Flying Training School and one (1) Flying Training School is 47,070 square feet.

The figure of 47,070 square feet is made up as follows—

| | Sq. ft. |
|---|---------|
| 23 D.H.9a machines, each 31 ft. x 8 ft. x 8 ft. | 6,704 |
| 27 S.E.5a machines, each 22 ft. x 8 ft. x 8 ft. | 4,762 |
| 39 Avro machines, each 28 ft. x 8 ft. x 8 ft. | 6,738 |
| 5 Sopwith Snipe machines, each 22 ft. x 8 ft. x 8 ft. | 560 |
| 20 D.H.9 machines, each 22 ft. x 8 ft. x 8 ft. | 4,600 |
| 3 Fairey seaplanes, each 31 ft. x 8 ft. x 8 ft. | 744 |

| | |
|--|--------|
| Spares parts now in store, both at Point Cook and at Spotswood, equals 2 hangars, each 9,000 ft. | 18,000 |
| Plus allowance of the above for gangways and passages, any | 3,000 |

| | |
|------------------------------------|--------|
| Total space required for "A" Group | 47,076 |
|------------------------------------|--------|

| | |
|--|--|
| GROUP "B"—AERO ENGINES AND PARTS | |
| In this group provision must be made to store 172 aero engines and spares for each type of engine. | |

| | |
|---|-------|
| The figure of 7,212 square feet is based on— | |
| 172 engines, each approximately 7 ft. x 7 ft. x 5 ft. | 3,612 |

| | |
|--|-------|
| Spare parts now in store and allowance for such. | |
| Spares parts as are on order or likely to be ordered | 3,000 |

| | |
|--|-----|
| Plus allowance for gangways and passages | 600 |
|--|-----|

| | |
|------------------------------------|-------|
| Total space required for "B" Group | 7,212 |
|------------------------------------|-------|

| | |
|--|--|
| GROUP "C"—TRANSPORT VEHICLES AND PARTS | |
|--|--|

| | |
|---|--|
| The amount of space required for "C" Group is 15,003 square feet, made up as follows— | |
|---|--|

| | |
|--|---------|
| Crocodile cars and tenders (10), each 17 ft. x 7 ft. x 0 ft. | Sq. ft. |
| 2,166 | |

| | |
|--|--|
| 30 Leyland, each 22 ft. x 7 ft. x 12 ft. | |
| 4,620 | |

| | |
|---|--|
| 15 motor cycles and side cars, each 5 ft. x 3 ft. x 3 ft. | |
| 175 | |

| | |
|---|--|
| 3 wireless repair lorry, each 22 ft. x 7 ft. x 12 ft. | |
| 151 | |

| | |
|---|--|
| 5 20 ft. trailers, each 6 ft. x 5 ft. x 5 ft. | |
| 308 | |

| | |
|--|--|
| 6 trailer trailers, each 6 ft. x 5 ft. x 6 ft. | |
| 180 | |

| | |
|--|--|
| 11 crocodile trailers, mark I, each 20 ft. x 7 ft. x 4 ft. | |
| 720 | |

| | |
|---|--|
| 2 crocodile trailers, each 22 ft. x 7 ft. x 4 ft. | |
| 308 | |

| | |
|---|--|
| Parts for all classes of transport vehicles, based on those actually stored on hand | |
| 2,000 | |

| | |
|--|-------|
| Plus allowance for gangways and passages | 4,000 |
|--|-------|

| | |
|------------------------------------|--------|
| Total space required for "C" Group | 15,093 |
|------------------------------------|--------|

| | |
|---|--|
| GROUP "D"—HAND TOOLS, MACHINE TOOLS, ETC. | |
|---|--|

| | |
|--|--|
| The total accommodation required for this group is 1,000 square feet. If the building is suitable, this group can be located with other stores, but bearing in mind the fact that plates, papers, and chemicals have to be stored in this group, possibly for long periods, the building must be of such a nature that the temperature is kept reasonably low throughout the whole year. | |
|--|--|

| | |
|--------------------------------------|--|
| GROUP "E"—PHOTOGRAPHIC CAMERAS, ETC. | |
|--------------------------------------|--|

| | |
|--|--|
| The total space required for this group is 1,000 square feet. This is based on actual stock on hand, bearing in mind the possibility of expansion increased when wireless stores are brought into the full establishment. These can be stored in the building with other stores. | |
|--|--|

| | |
|---|--|
| GROUP "F"—WIRELESS AND ELECTRICAL STORES AND INSTRUMENTS. | |
|---|--|

| | |
|---|--|
| The total amount of storage required in this group is 3,000 square feet. This is based on actual stock on hand, bearing in mind the possibility of expansion increased when wireless stores are brought into the full establishment. These can be stored in the building with other stores. | |
|---|--|

| | |
|---|--|
| GROUP "H"—AIRCRAFT GENERAL STORES AND GENERAL HARDWARE. | |
|---|--|

| | |
|--|--|
| The total amount of storage required in this group is 3,000 square feet. This is based on actual stock on hand, bearing in mind the possibility of expansion increased when wireless stores are brought into the full establishment. | |
|--|--|

| | |
|---|--|
| GROUP "I"—GENERAL MATERIALS AND GROUND EQUIPMENT. | |
|---|--|

| | |
|---|---------|
| This group has to be divided into two sections— | Sq. ft. |
|---|---------|

| | |
|--|-------|
| (a) Timber which requires to be stored in special timber store | 1,000 |
|--|-------|

| | |
|--|-------|
| (b) Metals, fabric, softgools, aerodrome equipment, &c., and miscellaneous equipment | 2,000 |
|--|-------|

| | |
|------------------------------------|-------|
| Total space required for "I" Group | 3,000 |
|------------------------------------|-------|

GROUP "J"—AMMUNITION AND EXPLOSIVES.

Only a very small amount of ammunition need be stored at the depot, but a magazine of three separate compartments will be required for—

- (a) Flares, signals, &c.
- (b) Small-arms ammunition.
- (c) Bombs.

The area required to store the whole of this group (ammunition, &c.) at the depot would not require to be more than 300 square feet, but providing accommodation in an explosives area is provided for, the area required will be 1,000 square feet. The storage space required for such other armaments and bombs does not arise with the depot, as all bulk stocks of such ammunition and bombs are stored in magazines under the control of the Military Board, Department of Defence. Total space required for "J" Group, 300 square feet.

GROUP "K"—PETROL, OIL, AND DOPES.

Petrol and lubricating oil will not normally be carried in depots by contractors. Deliveries will normally be made direct from contractors to aircraft bases, and it will be necessary to maintain a small reserve of petrol and lubricating oil in the depot to meet any emergency that may arise, necessitating transportation by road at any time when delivery could not be effected by contractors. This group has, therefore, been divided as follows—

- (a) Petrol store to accommodate 1,000 gallons of petrol in drums.
- (b) Oil store to accommodate 200 gallons of oil in cases.
- (c) Varnish and dope store. Approximate area required, 1,000 square feet.

In addition to the above, an open-air enclosed area will be required for the storage of wood and coal, approximately 100 feet x 100 feet.

GROUP "L"—CLIMMING, ETC.

The total area required for this group is 1,000 square feet.

GROUP "M"—HANGARS, CASES, AND CONTAINERS.

It is not proposed that anything in this group should be stored in permanent buildings except when it will be affected by being in the open air. Cases, containers, and metal containers which would rust. A percentage of cases available for despatching of stores will be maintained in a fit condition. Total area required for "M" Group, 1,000 square feet.

GROUP "N"—NIL.

GROUP "O"—NIL.

GROUP "P"—STATIONERY, OFFICE REQUISITES.

Total area required for this group, 500 square feet.

GROUP "Q"—CAMP EQUIPMENT, BARRACK AND HOSPITAL STORES.

Total area required for this group is 3,000 square feet.

GROUP "R"—MEDICAL STORES.

The total space required for this group is 300 square feet.

SALVAGE SECTION.

The figure of 1,600 square feet for this section is only the amount required in a permanent building. In addition to this, a large open area will be required, in which aeroplane cases specially fitted can be stored to contain scrap metals and salvage of various classes. According to the class of work that is being carried out by the Force, it would depend the amount of space required to give definite figures regarding open-air area required, but an allowance of at least 100 feet x 200 feet should be made.

RECEIPTS AND ISSUE SECTION.

The Receipts and Issue Section is the central receiving and despatch section, where all small stores are recorded inwards and outwards, where cases of small stores, when received, are unpacked and despatched to groups, and where small stores for despatches are checked and packed ready for transportation. Total area required, 1,000 square feet.

MECHANICAL TRANSPORT (RUNNING SECTION).

The running and mechanical transport section of the depot would need to be sufficiently large to accommodate the transport of the following units—

No. 1 Aircraft Depot.

No. 1 Squadron (mixed squadron).

The following provision will, therefore, be necessary:—

Armoured cars

Light lorries

Ambulances

Leyland heavy tenders (3 ton)

Leyland floats

Motor cycles

Motor cars

Trailers, Mark I

Trailers, Mark II

The total number of square feet required to house the above-mentioned vehicles is 12,750. In addition to this, it will be necessary to provide a repair shop for vehicles both in use and in store, and returned for repair from units. No machinery will be provided in this repair shop, all machine

work being carried out in depot machine shops. Provision is made for the following vehicles to be under overhaul at the one time:—

| | | | | | | |
|------------------------|----|----|----|----|----|---|
| Leyland lorries | .. | .. | .. | .. | .. | 3 |
| Crossley tenders | .. | .. | .. | .. | .. | 3 |
| Trailer | .. | .. | .. | .. | .. | 1 |

Motor cycles

Space required for this particular class of work, 4,600 square feet.

GENERAL.

Type of Buildings.—The type of building is governed by the fact that the material to be stored requires an even temperature—approximately 65 deg. F.—low humidity and good lighting and ventilation.

To obtain these objectives the store buildings have been designed in brick with high roofs and saw-tooth lighting.

Depot Workshops.—Attached hereto (Appendix "H") is a detailed description of the various workshops required for the Aircraft Depot.

The class of machine is shown together with number required. The greater part of this machinery is at present in store or in use either at No. 1 Station or at Spotswod.

In order that the most up-to-date method of installation may be adopted, it is proposed that the woodwork shanting be placed under the floor, and not on the ceiling. The machinery provides for—

- Metal workers' machine shop.
- Sheet metal workers' shop.
- Wood workers' machine shop.
- Blacksmith's shop.

All machine work involved in repair of aircraft, aero engines, and similar transport will be carried out in the above, and in each of them certain small bench apparatus will be required.

Provision has been made for workshops such as—

- Carpenters' shop.
- Engine repair shop.
- Fitting shop.
- Armorer's, dope, and paint shops.
- Armament.
- Wireless.
- Instrument repairs.
- Magnet and ignition repairs.
- Propeller.

For floor space required, see Appendix "Q."

It is proposed that the most economical method of arranging these workshops is for the whole of the machine shops and such shops as will make use of machines, i.e., armament, wireless, instrument, and magnet, to be under the one roof, and a separate building to be provided for sheet metal workers, blacksmiths, tailmakers, dope and paint shops.

Handling of Stores.—A "B" Group contains the largest equipment and requires the largest facilities for handling.

It is proposed to install a 6-ton travelling crane running through the storage shed over the roadway and over the trucks. The cases can then be lifted without any man-handling, and stored in the south end of the building, provision for a maximum number being allowed for not placing balconies on the south end. This will be necessary to prevent the sun's rays, and a saving of ground area can be effected thereby. The remaining bays will contain aeroplanes stored ready for erection, the fuselages and bulky parts on the floors, and the lighter material on the balconies.

Any packing will be done in the central passage, the height of the roof allowing the case to be lifted over another that is being packed. Easy access is given to the erecting hanger by passing through the north door along the tarmac, and so into the hanger. The engines in "B" group, which of considerable weight, are not bulky, and can be handled by trucks after unloading from a crane. Balances have been provided for this group, and allowance has been made for storage on the top of the offices.

Office Accommodation.—The offices are as small as possible for their duties, and are based on British practice regarding area. Their situation is all that can be desired, giving easy access to all parts of the depot, and allowing supervision of issues and receipts by road and rail.

Large Stores.—In road areas the depot have been made the width of the days in the building, so that, if necessary, separate units can be joined up, giving the best architectural appearance. Thus the large building (A.B. groups and offices) can be joined to the general store building with a minimum of expense.

Store Building.—The general store building requires a good light for the expert examination of the equipment, it requires access to the road and ground, and must be capable of extension, and the internal partitions must be flexible.

In addition, access must be given to the workshops, so that equipment found defective may be repaired before being replaced in stock. It is thought that all these requirements are met in the design.

Bomb Store.—It is intended to keep the major portion of bombs, very lights, flares, &c., at the Laverton power depot, but a reasonable amount must be retained on the aerodrome for which a special building is required.

Storage of Petrol.—Storage of petrol will be required for three purposes:—

- (a) In drums ready for despatch.
- (b) Bowser tank for filling machines on aerodrome.
- (c) Bowser tank for transport vehicles.

The spirit mentioned in (a) will be housed along with the oil in a separate building clear of all inflammable material.

Aviation spirit, as in (b), will be placed under the first erecting hanger.

Transport spirit (c) will be under the transport shed.

Transport Storage.—The transport storage is a difficult proposition to allow for. We have at present many vehicles included in the garrison equipment, and if they were to be all housed in the depot a large building would be required, but it is hoped that other vehicles will be established in the different States, leaving only transport in the depot sufficient for mobilization and depot and service squadron running transport.

This would considerably reduce the building required.

This difficulty has been overcome by allowing for the erection of a building to take care of the transport vehicles, to be there to receive and return an area for its expansion. If the total R.A.A.F. transport is retained in the depot, this building could extend to the living quarters, if necessary.

Transport Dock.—During the war it was found that the best means of loading transport was to run it on a line of flat trucks (with bridging across busses) from a dead end, having the necessary ramps for gaining the height of the truck.

This is proposed with a minimum of cost, and the ramps, which are quite necessary, will be arranged to run in with our time-table. Another advantage of this location is that the finished pilots are quite clear of the beginners, giving the latter every chance to complete the training with a minimum of interference to themselves and the best economy.

Allowance has been made for two service squadrons on the portion of the aerodrome best suited for landing purposes.

These squadrons should be as nearly self-contained as possible so that they could move into the field and commence operations in the same manner as their training has been carried out.

This idea has, of course, been subject to economic conditions. The lay-out shows two service squadrons with room for further expansion, but these are, of course, subject to future government policy.

The two hangers and offices, and workshops should be of a permanent character. The huts for sleeping accommodation can be removed from No. 1 station, Point Cook.

The cook house can be of timber construction.

2. To Mr. Jackson.—The Works and Railways Department have all the information as to the estimated cost. There is no proposal to connect Point Cook and Laverton by rail. It would cost £60,000 more to build a railway from the existing line to Point Cook and establish the depot at the latter place. That is one of the reasons in favour of Laverton as the Depot site.

3. To Mr. Blakeley.—There would be a broad-gauge siding from the railway line to the site of the proposed depot. The length of this siding would be half-a-mile

The machine shop (metal working) has been laid out with a view to the latest practice and economy of expense. The shafting and machinery and tools suitable for use are run by a group motor, thus saving wear and tear on shafting and lessening the risk of an entire breakdown.

Stand-By Plant.—Owing to the numerous stoppages in the power line it is thought desirable to have a stand-by engine and generator, capable of taking the full workshop load to gether with the essential services (sewerage, &c.) of the station.

Fire Protection.—Fire protection should be of the best and most comprehensive, as practically the total stores are inflammable. The Royal Air Force give the following state-ment which should be of considerable value.

Fire wastage—1929 (not including crashes), £145,500.

This great difference was brought about by careful organization of the personnel, inspection of buildings, adequate water supply, coupled with numerous fire extinguishers.

The recommendations on this subject will be referred to the Commonwealth Fire Committee.

Service Squadrons.—When the Citizen Forces of the R.A.A.F. have been trained up to an efficient standard, it will be necessary to provide a convenient station for them to carry out their continuous and day parades. Owing to the great convenience of the Laverton site, the service squadrons have been numbered as follows:—

1. Service Squadron, which will be the service squadron to the aerodrome and will be housed in the same building as the Laverton service squadron.

2. Service Squadron, which will be the service squadron to the aerodrome and will be housed in the same building as the Laverton service squadron.

3. Service Squadron, which will be the service squadron to the aerodrome and will be housed in the same building as the Laverton service squadron.

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air defence it is proposed to establish a dépôt at Laverton. If further land is required there I believe it could be acquired, but I do not think we shall require any further land unless it is for quarters for the men. Under this scheme there will be one dépôt at Laverton. Point Cook will be the central training flying school, where the initial training will be carried out. At Corio Bay, near Geelong, it is proposed to establish a Naval Flying Boat Squadron and a Torpedo Dropping Squadron. Those places will be under the control of the Air Board, and the dépôt will be the source of supplies. Repairs will also be carried out there. It is proposed to provide also facilities for the Citizen Force squadrons at Laverton in connexion with local defence and army co-operation, because of the easy access to the railway. If future development takes place along the lines we anticipate, it will probably be necessary to establish dépôts or parks in other States, but that depends entirely upon the expansion of the service. At present we are concentrating wholly at Laverton. The report dealing with the air defence of Australia has been approved of by the Air Council, which consists of the members of the Air Board and the Chief of the General Staff and the Chief of the Naval Staff. The Air Council controls the policy of air defence. The site of the dépôt as proposed in the report has been submitted to and approved of by that Air Council. No consideration has been given to establishing a dépôt specifically at Canberra, although we have considered the necessity for later establishing one in New South Wales, but that will depend entirely upon the expansion of the Air Force. If another dépôt were established it would not be essential to place it near the sea to facilitate the naval air work. In fixing the site at Laverton several advantages are obtained. There is good railway and road connexion, it is convenient to Point Cook, at which place the flying training will be carried out. It is also convenient by rail and road to Corio Bay, where the naval flying boat squadron and the torpedo dropping squadron will ultimately be placed. In my report I state that it is wise to have dépôts established a certain distance from the sea to prevent injury being done to certain classes of equipment by the action of the sea air, and Laverton is far enough from the sea coast to prevent injury of that nature. I cannot say whether that aspect was considered when the Flying School at Point Cook was established. In any case, Point Cook was not intended as a stores dépôt when originally selected. In comparison with a dépôt established in the other States, the one at Laverton possesses advantages from a training point of view owing to its proximity to Point Cook and Corio Bay. In addition, Victoria is a fairly safe place in which to carry out training operations, and it is not so particularly vulnerable as are other parts of Australia. It is also very convenient from an administrative point of view, because the head-quarters are in Melbourne. There is no advantage due to the meteorological conditions. We have recently purchased at a very satisfactory figure the Richmond Aerodrome in New South Wales, but we have no equipment there. The Richmond Aerodrome is about 15 miles from Liverpool, and is a very good site.

5. *To Mr. Mathews.*—It is not on the railway line that serves Liverpool.

6. *To the Chairman.*—By establishing this dépôt in Victoria, more advance will be made by us than by establishing it in the other States. In the event of an army of invasion the Air Force would probably be the first service to be called upon, and we want to have our units at the most convenient places. Wherever we decide to place a particular unit it will be necessary to provide accommodation there for machines and personnel. On the first page of my report, the fourth paragraph, I state that consideration will later be given to the establishment of aircraft dépôts in other States. It is hoped to eventually establish a unit in Western Australia, a

number of units in New South Wales, and possibly one in Queensland, but that will depend on the funds available.

7. *To Mr. Mathews.*—It is possible that Darwin would be included in the scheme.

8. *To the Chairman.*—It is not desirable to combine the workshops and the general mobilization stores in the same area, but we are doing it at Laverton because the number of squadrons in Victoria will not be very large. If we ultimately have a large air force we shall require separate mobilization stores as in the Army and Navy. I have had no complaints in regard to Laverton being too close to the sea. The Works and Railways officers have prepared plans in consultation with my department. They have been approved of by our own Air Force works officer. There has been the fullest co-operation. It is proposed to spread the construction of the dépôt over a period of four years. I have had eight years of Air Force experience, including several years in the Royal Naval Air Service and Royal Air Force of England. I have just completed a tour of instruction, and was for twelve months attached to the Air Force in England so as to obtain up-to-date information. I am fully in touch with the work that is going on in England, and I believe I had the full confidence of the authorities in England. In addition I have closely watched the development of the Air Forces of the other nations, although I have not visited those countries. I have not been to America.

9. *To Senator Reid.*—America sends officers to gain experience in England.

10. *To Mr. Mathews.*—Although France claims to lead in the matter of air defence, and has the larger force, I still believe in the superiority of England in quality, if not quantity.

11. *To Senator Reid.*—My report deals with aviation from a defence point of view. We do work in, as much as possible, with commercial aviation, but that is largely run by private companies. The Controller of Civil Aviation does not require a dépôt for his own purposes, and we help him as much as possible. The policy of subsidizing commercial aviation has already been adopted, but it is a direct arrangement between the Government and the Controller of Civil Aviation, Colonel Brinsmead. That matter affects the Air Council. From a defence point of view, consideration has been given to linking up our operations with the air service from Charleville and Cloncurry and with that of Western Australia, but there are objections to it, mainly because we have not sufficient personnel to carry out our own training activities without embarking on other work. The personnel employed on the civil routes could be utilized in case of war, because they are members of the Air Force Reserve, and, if necessary, we could take over these men and their machines in time of emergency.

12. *To the Chairman.*—That is part of the agreement which has been entered into.

13. *To Mr. Jackson.*—The majority of the machines at present used on the civil routes are converted war machines.

14. *To Senator Reid.*—The overseas scheme of air communication, with a landing point, say, at Darwin, relates to air ships, and would not come under our jurisdiction. These stations we are establishing are of no use for air ships since they would require a different type of station and different facilities. Owing to their length they require specially constructed hangars. We could, at any one of our stations, erect a mooring mast at which to moor them if necessary, but we could not house them. It is not yet definitely known what route across Australia the airships would take, but the majority of the routes for commercial purposes have already been surveyed by us, and it will simply be a matter of joining up where necessary.

My Department laid out the route which Sir Ross Smith followed from Darwin across to Daly Waters and then to Charleville. Aerodromes and landing places established at these places would be of use for defence as well as for commercial purposes. The dépôt at Laverton is the most suitable arrangement that we can make under present circumstances, and there is room there for expansion. In fixing this site, I cannot say whether the probable transfer of the head-quarters to Canberra at any time was considered. It was thought of, but we do not know what the ultimate result will be. It will depend on the policy of the Government. It is proposed later to establish subsidiary dépôts in other States. The aviation facilities in Western Australia and Queensland would be of no use to us as aircraft dépôts, as they consist of hangars for one or two machines, and would not serve for storage purposes.

15. *To the Chairman.*—They would be useful as landing places.

16. *To Mr. Mathews.*—The training for civil aviation would not be of much use for our purposes as training in special subjects. Our officers specialize in naval and military co-operation, and we teach them all the intricacies of these special classes of co-operation. For civil aviation a route is properly surveyed and landing places marked, and it is purely a question of flying from one place to another. We teach our officers not only flying, but they must have a knowledge of engine construction, wireless, bombing, meteorology, and other subjects. I would not consider it a waste of effort, but it is not desirable at present to use Royal Australian Air Force personnel on civil aviation mail routes. At our present establishment we have 136 men, but we will require about 200 to overhaul the machines that are to be stored at Laverton. The majority of the persons in the temporary dépôt section of Point Cook will be transferred to Laverton. Point Cook will be transferred to a flying training school. All the men who are at present training are Australians, and out of our present pupils only two have had a little flying experience, although they did not graduate. None of the others has had any previous flying experience. In certain trades we find difficulty in getting mechanics to work at Point Cook, chiefly because they can get better wages outside, and also because there are not sufficient married quarters there for all the married men, and it means separating from their families, except at week-ends. Those who are there are, I believe, fairly contented, and I have had no complaints about the conditions except lack of suitable accommodation. The difficulty of obtaining mechanics will disappear to a great extent when we have the dépôt at Laverton, because the railway facilities will enable the married men to be within easy access of their homes at Newport, Spotswood, and various other places on the railway line. The difficulty at Point Cook is that it is 5 or 6 miles from a railway station, and that in certain trades the mechanics can obtain better wages outside. I do not consider that there is any extreme discipline at the flying school.

17. *To Senator Barnes.*—The £3,000,000 previously mentioned by me was the estimate for equipment only, and not for buildings or personnel. That cost has not yet been worked out. It is quite likely that future expansion of the air force will take place in New South Wales. In the event of war, we would not be able to defend Brisbane adequately from the Laverton dépôt. That question must be faced, and if there is to be a large air force on the eastern coast, other dépôts will need to be established. I have not the figures with me of the estimated cost of encircling Australia with an adequate scheme of air defence, but it can be worked out. The yearly upkeep of the equipment is estimated at £500,000.

18. *To Senator Lynch.*—The proposed dépôt at Laverton was considered by the Air Board, and its

recommendation was made to the Air Council. The latter is the superior body. The decision to establish a dépôt at Laverton was based upon the experience gained at the war. The authorities in England have been informed of the proposal to establish this dépôt at Laverton, and they have had details of the whole scheme, as originally submitted. The Air Ministry was asked to criticise the scheme, and although they did not do so, yet they raised no objection to it. In formulating this scheme we have been working in close co-operation with the Imperial authorities. I could not say what period the expenditure of the estimate of £3,000,000 will cover. That entirely depends upon the Government. The initial cost is the same, whether it takes five or ten years. That estimate is for equipment only, and other expenditure will be necessary for buildings, land, personnel, and so forth. We have not gone fully into that expenditure, as it is a long way ahead. It will cost a lot of money. It costs much more than £3,000,000 for a battleship, and that sum will provide for about twenty-six squadrons of air planes, flying boats, and sea planes. We would require three dépôts, or parks, and eight or nine other stations to give full effect to the scheme. The geographical position of Australia tends to make the expansion of the Air Force dependent to a large extent on the demands for aircraft co-operation by the Army and Navy. Fighting squadrons are of course required for local defence, but, unlike England, with its close proximity to other powerful nations, a large independent air striking force is not so necessary here. In the event of war we would require the three defence services; one being just as vital as the others. I have heard, in the event of war, of huge aeroplanes bombing cities out of existence. That might possibly happen in Europe, but Australia is a long way from any aeroplane base of other countries. They would have to carry aircraft in carrier ships, and they could not bring large numbers of them in that way unless they had a great many carriers. The Washington Conference limits the tonnage of aircraft carriers. The establishment of the dépôt at Laverton instead of, say, in New South Wales, has not been done for political reasons. I believe that Victoria is the best place in which to carry out the initial training. There will necessarily be two or three service squadrons for the local defence of Melbourne, and to operate with the local army divisions, and we shall also require service squadrons in New South Wales, Queensland, Western Australia, and possibly elsewhere. It would appear more likely for an invading army to land on the east coast than in the north. There are many different types of aircraft for naval purposes, such as the advanced patrol machine (the flying boat), the reconnaissance, and the spotting machine (the "Fairey" sea plane), the torpedo dropping machine, and the bombing machine, and then the smaller fighting plane. The same thing applies to the army. They have long distance and short distance bombing machines, long reconnaissance and short reconnaissance and fighting machines. It combines these three forms of activity, offensive, defensive, and observation. We are at present carrying out experiments in wireless telephony. We are also watching experiments in England. We have wireless telegraphy in full swing, and a wireless telegraph station is established at Laverton.

19. *To Mr. Cook.*—Laverton is the best site for the dépôt, in order to supply Victorian units. No matter where they are formed in other parts of Australia, we will still require a dépôt in Victoria to feed those units. The whole scheme of permanent buildings is estimated to be £298,636. These figures were supplied by the Director of General Works, who could no doubt give you detailed information. The expenditure asked for will be ample to supply the requirements of Victoria. There is also ample space for immediate requirements. We could manufacture aircraft in our dépôts with the exception of the engine, but the workshops are really for repair

work and overhauling, and not for manufacture. In an emergency, we could manufacture machines, but it is not intended to do so. The manufacture of aircraft is a question for the consideration of the Munitions Supply Board. In time of war it is necessary that the Air Service should co-operate with the Army and Navy services to determine a definite policy of attack or defence.

20. *To Mr. Gregory.*—The work will be more cheaply done at Laverton than at Point Cook, owing to railway facilities. If Point Cook station did not exist, and we were starting from nothing, it is possible Point Cook might not be selected. Laverton is the best site in view of the fact that Point Cook already exists as a flying training school. The flying boat squadron and the torpedo squadron will be at Corio Bay, and the squadrons for co-operating with the army and for the local defence of Melbourne must be placed near Melbourne. In respect of the defence of Australia it is hoped that other units will be established. Victoria from a topographical point of view, and from the view point of safety, is a suitable place in which to carry out initial training. The expenditure asked for will cover practically all that will be needed for years to come under normal peace conditions. Laverton is to be used for the storage of equipment and the repair and overhauling of machines. It is to be the centre of the whole scheme in Victoria, and Point Cook will be purely a flying training school. A certain amount of citizen force training will be carried out at Laverton. We hope to build up our local defence squadrons from the permanent forces and the citizen forces of Melbourne. The citizen force trainees will devote certain half-day parades and one camp a year at Laverton, so as to keep up their training. It is quite different from initial training, as it becomes annual training. *To Mr. Cook.*—At Laverton will be housed the squadrons for army co-operation and for the local defence of Melbourne.

21. *To the Chairman.*—The flying officers and flight lieutenants retire at the age of 40; the squadron leader (corresponding with a major of the army), retires at 45, and the commander retires at 48. That is an average of ten years earlier than in the other services, and twenty to twenty-five years earlier than the Civil Service. It is not considered by the medical authorities that an officer is fit for full flying duties after the age of 40. Under appendix A of the Report, we are arranging for eight quarters for married men. Of the mechanics at present at Point Cook over 50 per cent. are married, and when they get to Laverton their grievance in respect to quarters will more or less disappear. The railway will then enable them to be in constant touch with their homes, say, at Newport, Spotswood, and other places on the line. A water main is adjacent to Laverton, and the Works and Railways Department are making a special reference to that matter in their Report, and also respecting a fire service. Concerning the electric supply, at present a power line runs to Point Cook. We have submitted a recommendation that a stand-by plant should be provided at Laverton. We at present get our power from Newport, from the Railway Department, but the supply is not quite satisfactory. The line, on numerous occasions, has broken down, and to obviate the workshops being completely cut off from electric power, we are recommending that a stand-by plant should be provided. It is quite possible that our present power line might be taken over by the Electricity Commission. I have heard a rumour to that effect. The Morwell scheme will be four or five miles away from Laverton. At present we have no difficulty in getting all the power we want. We have a considerable quantity of air craft and motor transport material stored at present at Spotswood, valued at approximately £750,000. Every part of those aeroplanes will have to be thoroughly examined and over-

hauled, since they have been in cases for over four years. The explosives will be stored at the Laverton powder magazine, which is a mile or two away from the proposed depot. Special arrangements will be made for its protection.

22. *To Senator Lynch.*—The necessity for governmental action in commercial aviation is not mentioned in the report, because it has really no bearing on the scheme. A standard is laid down of the proficiency required for flying officers. Those engaged in civil aviation conform to that standard, and are enrolled as members of the Air Force Reserve. When the Air Force is in proper swing these men will be called up, to pass regular tests. At the present time we have four young men desirous of entering civil aviation, who are training with us as pilots. If they reach the desired standard, and on completion of their course are employed on the civil routes, they become members of the Air Force Reserve, and we can call upon them at any time. The persons who are engaged on the civil aviation routes will not require to take advantage of the facilities afforded by the depots or stations proposed to be erected under this scheme. On the mail route in Western Australia they have their own small workshops and landing grounds, which we surveyed for them. The same applies to Queensland. They are really right away from the depot at Laverton, and they have their own source of supply. It is a question of business arrangement. At present the Government has gone as far as it needs in requiring private companies to conform with certain standards, so that the aviators' services can be availed of later if required. We hope to make the Air Force equally useful to both the Navy and the Army, to co-operate with the Navy at sea, and with the Army on land. Ultimately we anticipate that a large portion of the Air Force will be in New South Wales. The Air Force this year will not be developed to any extent. We shall simply carry on as we did last year.

23. *To the Chairman.*—We cannot carry out any extension of the Air Force until we have a depot in which to concentrate the equipment that is at present stored in cases at Spotswood. It is necessary that it should be thoroughly examined and overhauled and housed under proper conditions. Buildings should be erected at Laverton, so as to afford proper protection for the plant. That is why the construction of this depot is urgently required. While stored in cases the equipment depreciates much more rapidly than should be the case. We cannot expand in any way until we have the equipment properly stored and examined. In an emergency we are not in a good position to mobilize. As much material as they can accommodate, we have transferred to the permanent hangars at Point Cook, that were originally built to house aeroplanes. They have a special roof truss, and so forth, for this purpose. We had to shift all the aeroplanes from the permanent hangars, and transfer them to the canvas Bessonneau hangars, which are really intended for temporary use in time of war. These machines have been there for over two years. The canvas hangars have been re-covered two or three times, and when a strong wind blows we have to detail men to hold them down, and the loss in man hours is considerable. The Works and Railways Department hope to have the first year's programme completed within that time. The plans have been ready for some time, but the Works and Railways Department will not supply detailed drawings until the general scheme is approved. If the Committee decides to approve of this work the Works and Railways Department can immediately proceed with the detailed drawings, and probably save several months' delay. It would be very advantageous to us, as the work is most urgent.

(*Taken at Melbourne.*)

TUESDAY, 28th AUGUST, 1923.

Present:

Mr. GREGORY, Chairman;

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|----------------|--------------|
| Senator Barnes | Mr. Cook. |
| Senator Lynch | Mr. Jackson. |
| Senator Reid | Mr. Mathews. |

Percival Alexander McBain, M.R.E., Squadron Leader, Director of Equipment, Royal Australian Air Force, sworn and examined.

24. *To the Chairman.*—During the whole of my service with the A.I.F., I was with the Australian Flying Corps. I left Australia with a Flying Corps unit, for two years I was stationed in Palestine. After the Armistice I returned to England, and spent about six months investigating the various Royal Air Force stores, depots, and equipment, so that on the foundation of the R.A.F. in this country we should have first-hand knowledge of equipment matters in connexion with the Royal Air Force. I was specially detailed to make the investigation. I returned to Australia at the end of 1919. I was then appointed Equipment Officer for the Australian Air Corps, which is now the Royal Australian Air Force. During my stay in England after the Armistice I made the necessary demands on the Royal Air Force in respect of our gift aircraft equipment. As this Committee is aware the British Government presented the Australian Government with one hundred aeroplanes. That matter is referred to in the report of the Public Accounts Committee. That equipment arrived in Australia in 1920 and 1921. Unfortunately, we had no proper storage accommodation available for it. We had great difficulty to find any housing accommodation. We look upon the erection of the Laverton buildings as an absolute necessity. The Air Force of this country must be fully equipped. We have, approximately, £1,000,000 worth of equipment, which, if not properly housed, will deteriorate. If it is properly housed it will have a much longer life. The present storage is not by any means ideal. The life of aircraft varies. The equipment we at present have would last a hundred per cent. longer if it were properly housed than if it be left as it is in the temporary accommodation. Even if the material does deteriorate it will have to be replaced by up-to-date equipment. It has to be remembered that the equipment is not only aircraft. It includes mechanical transport and spare parts. The greater number of the planes we have now are not obsolete. I am partially responsible for the general lay-out of the proposed depot. I keep in close liaison with the Works Branch, who act in co-operation with the Works and Railways Department. Any minor alterations would be made through our Works Branch. There has been the closest co-operation in having the plans prepared, and everything is satisfactory. Information on the general scheme has been sent to the Air Ministry, but we have not sent information of the details. We do not think it is necessary that that should be done. Of course, we desire the fullest advice that we can get, but we have practical men here, who are well qualified to advise. I assure the Committee that this scheme has received mature consideration. It is nearly two years since it was first introduced. The first work to be put in hand will be the stores and workshops. That will be the first instalment of the complete plan. The complete proposal is shown in Appendix "A" of the report. This depot is not a depot in the same sense as a naval depot or army depot. It is not a place where personnel will be trained for parades, nor is it a flying training school. It is purely a stores depot. The flying training school is at Point Cook. This depot may well be termed the warehouse of the Air Force. The depot, as proposed, will be sufficient for all the future requirements

of Victoria, and also for all the units of the Air Force, as at present constituted. Under present conditions, it would not be wise for us to contemplate establishing a depot in any of the other States. It would be no use having the squadrons in Victoria and the stores depot elsewhere. As the Air Force expands we shall have to have stores depots elsewhere. In the lay-out at Laverton we have allowed for expansions. It is proposed that the complete construction of the depot will occupy four years, though I hope it will not take as long as that. Appendix "B" of the Report will show why we are establishing at Laverton. It has to be realised that we have a training station at Point Cook. If we have a sea-plane base at Port Phillip Bay, Laverton will be a convenient place for the stores depot. Then, again, we own land in this vicinity. I have dealt in my report with all the reasons which make Laverton the most suitable place for the Air Force depot. It is accessible to railway and roads, and is also on the main road to the proposed sea-plane base, and the main road to Point Cook. Taking all things into consideration, including rail and road facilities, and water supply, Laverton is the most suitable site that we could find. This depot is, in effect, what would be known in England as an aircraft park. It is only a small portion of what the British Air Ministry knows as an aircraft depot. When the Air Force expands we shall have four or five units in New South Wales, and others in Queensland, we shall have to have other stores depots, just as the Army has great establishments in the various States. It would not be wise, under present conditions, for us to put our stores depot in another State while our units are here. The Committee should realize, however, that it will not be necessary to establish a training school, such as we have at Point Cook, in every State. The training that is required can be done at Point Cook. The lay-out provides for the barracks and married quarters to be on the main road, and our stores and workshops are adjacent to the railway line. There is proper provision made for all possible extension in the future. For instance, if we want to enlarge our workshops we can run down for three-quarters of a mile towards the Geelong-road. I do not think the need for any such extension as that will arise. We have isolated the stores and barracks and various other buildings, to minimize the risk from fire. There is provision for a good water supply. The details of the water supply arrangements will be supplied to the Committee by other witnesses. The use of sprinklers for fire protection has been suggested, and we anticipate that the Works and Railways Department will give us a definite ruling on that before their engineer gives evidence to the Committee. We have also considered the question of overhead cranes. When we take the Committee down to Spotswood and Point Cook we shall show them the kind of cases that we will have to move. They weigh up to four tons, and are from seven to eight feet high. We appreciate the fact that the use of man-power is inadvisable when mechanical power is available, because mechanical power is so much more economical. We only propose the use of overhead cranes in the main building—that is the most westerly building. It is proposed that the cranes shall run the whole length of the building, and also over the railway line and loading platform, so that we shall be able to take these four-ton cases from the building, and place them into the trucks, and also take them from the trucks, and place them in the building as need arises. The plan also provides facilities for placing them on motor vehicles, when that may be necessary. This store is 270 ft. long and 174 ft. wide, with walls 20 ft. high. That will give ample height. The lift of the crane is so designed that we shall be able to remove cases even when there is another case of the same height in the track of the crane on the floor of the building. These are about the largest cases we shall ever have to handle. If the machines are made

very much larger trouble will arise in railway transport. The crane will run right down the centre of the building. The building will have a series of balconies, under which the cases can be stacked. As they are required they will be placed on rollers, and put in such a position that they can be handled by the crane.

25. *To Mr. Mathews.*—If the size of the aeroplanes increases very much the engines will have to be packed in components about the size that we are now handling, otherwise it will be impossible to handle them on the railway.

26. *To the Chairman.*—The workshops are planned according to the present British practice. There will be a series of workshops, in each of which certain work will be performed. We are providing for machinery which has been found by experience to be required in aircraft depots. We are providing for a wood working shop, a metal working shop, a propeller shop, a "doping" shop (really a paint shop, but it is a particular kind of paint, which is used for the wings), an instrument shop, a wireless repair shop, a mechanical transport shop, an armoury and a photographic shop. Aircraft activities cover all these different trades. In the comparisons given in the report, it will be seen that the space allotted by the Royal Air Force for a Squadron's workshop and that which has been allotted for our aircraft depot, varies in certain respects. The reason for that is that the British requirement is for a squadron, while we reckon that our plan will provide for a complete depot. It must be realized that the Air Force is organized in squadrons of eighteen machines each. A squadron is the normal unit which goes into the field to operate against the enemy. Three or four of these squadrons are generally formed into a wing, and three wings form a brigade. One depot is normally able to deal with the equipment and repairs of three wings, which is twelve squadrons. It must be remembered that if it is necessary to mobilise—say, within twenty-four hours—you have eighteen aeroplanes in each squadron to deal with, and each aeroplane will occupy a space about twenty-seven feet long and weigh about four tons. Motor vehicles will be required to carry them, if they are to be transported by road. Even if they are transported by rail, the motor transport will be needed at the other end. For that reason mechanical transport is a very important factor. Each squadron of eighteen machines has fifteen motor lorries allotted to it for its own use. We received our gift equipment on the basis of four squadrons, so that at present we have about seventy motor lorries.

27. *To Mr. Mathews.*—These were included in the British Government's gift for the establishment of our Air Force. We tried to look at this matter altogether from a business standpoint, and saw that if these motor lorries were allowed to remain unused they would deteriorate to such an extent that in the course of eight or ten years they would become absolutely useless. We therefore looked round to see if we could find some way to use them in another department, under an agreement which would protect our interests. We realized that the Postmaster-General's Department needed transport facilities, and therefore suggested to that Department that it should standardize its equipment on the same type of vehicle as we have, and that when it wanted a vehicle it should take one of ours, and pay us the replacement value of the vehicle. That agreement was adopted, and, in pursuance of it, I have handed over ten vehicles to the Postmaster-General's Department, and I have sufficient money in hand now to buy ten more vehicles, to replace those which have been handed over. By that method we are providing against finding ourselves, after a few years, with a number of obsolete lorries.

28. *To Mr. Jackson.*—We have made a business arrangement. Two other departments are at present negotiating with us for the use of vehicles.

It must be remembered that if we should require to mobilize at a moment's notice we would not be able to easily obtain sufficient motor vehicles of the type we require.

29. *To the Chairman.*—Each squadron must have its own transport arrangements. At present we have equipment for only four squadrons here. Victoria will want at least four squadrons, and other squadrons will be required for New South Wales, and possibly for Queensland. When the Air Force expands to such a degree that we can provide for the needs of New South Wales and Queensland, we shall have to include in the provision motor transport facilities. We do not want to move our equipment about unnecessarily. Our equipment at present is at Point Cook and Spotswood. When units are established in New South Wales they will have to have their own transport vehicles. The total proposed expenditure on buildings for this depot is estimated to be £296,000. It will be incurred over a period of four years. That does not take into account expenditure on equipment. It is purely for buildings. There are really no store buildings at Point Cook, except one small structure, which involved an expenditure of about £7,000. When the Air Force becomes established in New South Wales, or any of the other States, we do not anticipate that there will be necessity for a repetition of such expenditure for training expenses as has been incurred at Point Cook. We do not propose to establish a training station wherever there is a depot. One training school for Australia will be sufficient in peace time, except that it may be desirable to give members of the A.I.F. a refresher course elsewhere sometime. If this country is to have an efficient Air Force, it will need squadrons in the various States, but the number of squadrons is a matter of policy. Wherever squadrons are established, stores depots or aircraft parks will be necessary. I make it clear, however, that though we shall need stores depots in the other States, we shall not need training schools, such as we have at Point Cook.

30. *To Mr. Mathews.*—The mention of a bomb store on page 14 of my report refers only to making provision for such material of that nature as may be required urgently at any time. Our general explosives store for Victoria is the magazine of the Victorian Government at Altona, which is about a mile and a half from Laverton. We have five magazines belonging to the Defence Department in the State Government magazine. It will be realized that it is necessary to have available a small amount of ammunition, for urgent purposes. The bomb store mentioned in the report is intended to contain only a small quantity of supplies, for use on special occasions. That remark applies also to the provisions for storing petrol. The question of providing for a bulk storage of petrol for mobilization purposes has not yet been dealt with. No doubt it will be preferable to provide for such a reserve near the seaside, where it may be pumped directly from the ship into the reserve tanks. The arrangements in connexion with the supply of tools for the workshops have been carefully made. We do not keep a bulk supply of stores in each workshop. We have not sufficient men in training to-day to man one complete squadron. Although I think we have sufficient equipment for four squadrons, we have nothing like sufficient men for them. We have not enlisted any citizen force men yet. We do not import the whole of our material, although originally we were compelled to do so. We have taken steps to have some of it manufactured in Australia. Six complete machines have been built in Australia. A lot of what may be called standard fittings are manufactured here. Generally speaking, each maker has all the metal fittings on his machine peculiar to that particular type, and all parts such as those have to be imported. Engines have been made in the Commonwealth, but at the time when they

were manufactured, engines were not as complicated as the present high-power type. The machines that were made here, and also the engines, were quite satisfactory, but there is not a sufficient market for the business to be undertaken on a commercial basis. Even if engines were manufactured here, we should have to import particular kinds of steel and also magnets. The whole plane could be manufactured here at a price. The rubber parts of aeroplanes perish comparatively quickly. If machines are not kept properly housed they will deteriorate rapidly. That applies especially to the fabric in the wings, which becomes slack, and necessitates opening the wings and tightening it. There are four types of machines in our gift planes, some of which are still standard in England. The training machine, which is included, is still standard, and so is the DH9A. The DH9 is another type that was included in our gift. It is not being used in England at present. The reason for that is that so many types were being used that the authorities had to declare some of them obsolete. We do not intend to replace that type of machine. We are following British practice to a great extent, but our technical advisers tell us that we shall have to design machines specially for this climate. There are such wide variations in climatic conditions in Australia. When machines are built in England the moisture content of the woodwork is 15 per cent. When a machine goes to a tropical climate the moisture content is reduced, and that reacts on the strength of the timber. If such a machine were permanently stored in Melbourne, the reduction in the moisture content would not be noticeable. There would be a change if the machine were sent to Brisbane, though even that change would be nothing like as great as would be the change in a machine sent to Egypt from England. When a machine becomes obsolete we do not scrap it, but save every part. The various parts are used for spares. We never scrap a whole machine. The engine of an aeroplane could be used for a motor-boat, but it would be a luxury to have such a high-powered engine in a motor boat. We save the parts of engines in the same way as we save the other parts of the aeroplane.

31. *To Senator Barnes.*—There has been a difficulty in getting Australian timber of the necessary strength and lightness to construct aircraft. Such timber as has been obtained has usually come from the north of New South Wales. The timbers we have mostly used are eucalypt, mountain ash, and blue fig. One of the greatest difficulties is to obtain timber of the necessary length. Most of the timbers I have mentioned grow in short lengths. The Canadian spruce grows to a tremendous height. Suitable Australian timbers are not grown in sufficient quantity, nor of the necessary length, to enable us to make great use of them. It has not yet been considered whether it is practicable for us to grow timber for building aeroplanes.

32. *To Senator Lynch.*—The main lines of policy in connexion with the Air Force, as laid down in England, are such that it is essential for the force to work in conjunction with other services. For instance, an Air Force can be of three types. There may be an independent Air Force, an Air Force for co-operation with the Navy, and an Air Force for co-operation with the Army. In England at present these three types are provided for. A portion of the British Air Force may be allotted to co-operate with the Navy, a portion with the Army, and another portion is independent. Our force is being established on the same lines, with the reservation that we do not need an independent force so much as they do in England. It is not likely that we shall have to send a bombing expedition from Australia to another continent. In the case of our Navy having to go out to attack an approaching enemy, it will be necessary for the Air Force to co-operate. If an enemy force landed it would then be necessary for our Air Force to co-operate with the Army. Our training is calculated to supply both needs, and we are also training men to operate independently. I have visited all the notable British Air Depots and, speaking generally, I have not noticed any noteworthy mistakes. Their practice, so far as I can see, is on sound lines, and we have practically copied it by sending our men off to England for instruction. They have all the necessary organization in the way of colleges and training grounds to give adequate instruction. The depot we are proposing to construct at Laverton could be placed in the corner of any one of five or six depots in England. I know the British depots, and they are much larger than that which we propose to establish. The comparison I have made in my report shows that we are asking for less for a depot than they have for a squadron. One reason for that is that the British depots developed in war time, and they will gradually diminish. They had such huge stocks of material at the end of the war that they were compelled to occupy large areas. The British depots are sub-divided. They have what they call stores depots, repair depots, and mechanical transport repair depots. On account of our great distances, we shall have to make each of our depots that may be established in the different States, self-contained. The English depots are at Ruislip and Kidbrooke, which are near London; Milton, which is 100 miles from London in the Midlands; and Shrewsbury, and then the British Air Ministry have two depots in Egypt, and one depot in Mesopotamia. The general scheme was submitted for the consideration of British experts, and there was no adverse criticism of it. The activities of this depot will be similar to those of the depots in England. I am aware that the covenant of the League of Nations made it almost mandatory on the signatories of the covenant that in future the manufacture of munitions of war should be Government, and not a private, enterprise. But I doubt whether we have reached the point where it can be said that the stores which we require are actually munitions of war. Before we establish any manufacturing industry for aircraft supplies, we intend to conduct a small experimental establishment, to prove what can be done. We got our present supplies of spare parts from the British Air Ministry, and they purchase them from private manufacturers. We do not undertake to do repair work for private aviation companies, because there are private business firms which do that work. We render all the help we can to the civil aviation authorities, and when they are unable to obtain spare parts in Australia, and we have the parts, we supply them. The land at Laverton cost £3,500. I think there is something like 150 or 160 acres. The site was acquired about two years ago. The land around Laverton is not cheap, and I think the Government could make £10 an acre on its bargain to-morrow. We have ample space for all possible requirements. The buildings coloured green on the plan are intended for use in connexion with the training of citizen force men. It would not have paid us to establish this depot at Point Cook, for reasons which I have explained in my report. I believe our plan compares more than favourably with the provisions for similar purposes in Great Britain. It is not our purpose to enter into competition with civil aviation firms; we wish to render them every assistance possible. The lay-out of this stores depot has no bearing whatever on the question of civil aviation. Portions of the British Government's gift equipment are at present stored in Bessonneau hangars, which were designed for active service. It is regrettable that such equipment has to be stored under canvas. It is not by any means suitable housing accommodation. Apart altogether from the point that the Laverton depot will provide suitable storage accommodation for the gift equipment, it is necessary as part of the foundation of our Air Force. I have described fully in my report the reasons which led to the selection of Laverton as the site for the depot. Before Laverton was

selected an inspection was made of places at Seymour, Kilmore, Geelong, Essendon, Glenhuntly, and other localities where aviation activities had been carried on. Laverton was easily the best of them. We shall get a sufficient water pressure by building water towers. The Works and Railways Department is increasing the size of the mains as far as Laverton. We have special men allotted to deal with any possible fire outbreak. Our organization in that respect has been supervised by the officers of the Fire Brigade Board. We realize that we must be ready to meet any emergency.

33. *To Mr. Cook.*—All the gift material that we received from Great Britain is well worth storing. The members of the Committee will see that when they visit Point Cook. The buildings provided for in this plan are to be of brick. The approximate cost is £296,000. The portions shown in brown on the plan are to be erected in the first year, those in yellow the second year, and those in blue the third year. I have seen quite a lot of German, American, and French planes. I am satisfied that the British planes are the best. That was proved during the war.

34. *To Mr. Mathews.*—By the time the end of the war was reached we had overtaken and passed the Germans in aviation development.

35. *To Mr. Cook.*—The total number of employees in the temporary depot at Point Cook is 136, and they include men of 20 different trades. The whole of the establishment is under the control of an officer in command of the depot, and there are other officers under him in charge of the stores and workshops. The number of squadrons which will form the Australian Air Force must be decided by the Government. It is a question of policy. At present we have not enough men to form one squadron, and only £3,000 is allowed on this year's Estimates for purchase of new equipment. If we are to have a complete force we shall require something like £6,000,000. I understand that the reason why no more money is provided is because the whole question of defence expenditure has been postponed until after the Imperial Conference. I am satisfied that we are obtaining all our requirements at competitive rates.

36. *To Mr. Jackson.*—The reason why the transport spirit tank is under the floor of the building is because it minimizes the risk from fire. It is the usual practice to put such storage tanks under the floors. The power petrol pumps are seen in the city streets, but the storage tanks, from which the pumps draw, are always under the garage floors. Any accidents which occur are the result of carelessness. There is not so much risk of fire when the spirit is stored under the floor as when it is stored in a tank alongside the building. Of course, we prevent men from smoking in these shops

specially adapted for its use. The question of storage of oil fuel has not yet been dealt with.

36. *To Senator Reid.*—The buildings shown in the plan which are before this Committee will be constructed according to the latest information. The roofing principle in the workshops is that which is being generally adopted in commercial buildings. It is the most up-to-date. The chief architect at the Works and Railways Department will, no doubt, give you full details about that. Our stores and workshops are lighted by windows, as well as through the roof. A large percentage of our staff had practical experience in the war. All other things being equal, preference is given to returned soldiers. We have had difficulty in securing sufficient wood workers, and therefore some younger men have been employed. Usually they are men who have gone through a technical college. After six months training the men are re-instructed as riggers. A thorough knowledge of wood work is required before a man can efficiently do rigging work. The reason why we cannot get sufficient men is because we are not able to pay as high wages as those which prevail in civilian employment. The Victorian Railways Commissioner will build our railway siding. It will not be more than ten yards from the main line, and will be on railway property. We shall pay the cost of the original construction, and also a rental. One reason why we did not establish the stores depot at Point Cook was because a railway would have had to be built. When we get into permanent buildings our men will be able to do their work a hundred per cent. more efficiently. We have not yet a sufficient equipment to adequately defend Melbourne. We could not send a squadron immediately to Sydney, for the reason that all the machines would have to be overhauled before they could be sent on special service work. To do that would take over a month.

37. *To Mr. Jackson.*—The buildings shown in the plan will not be permanent structures. They will be used for training members of the citizen forces, and will probably be occupied only twenty days in the year. Therefore it is not proposed that expensive buildings should be erected.

38. *To the Chairman.*—The reason why the transport spirit tank is under the floor of the building is because it minimizes the risk from fire. It is the usual practice to put such storage tanks under the floors. The power petrol pumps are seen in the city streets, but the storage tanks, from which the pumps draw, are always under the garage floors. Any accidents which occur are the result of carelessness. There is not so much risk of fire when the spirit is stored under the floor as when it is stored in a tank alongside the building. Of course, we prevent men from smoking in these shops

(Taken at Melbourne.)

WEDNESDAY, 29TH AUGUST, 1923.

Present:

Mr. GREGORY, Chairman;

Senator Barnes; Mr. R. Cook

Senator Lynch; Mr. Mathews;

Senator Reid

Colonel Thomas Murdoch, Director of Works, Defence Department, sworn and examined.—

39. *To the Chairman.*—I have been associated with the proposal to erect an aircraft depot at Laverton, both with regard to the selection of the site and the construction of buildings. The site selected is suitable for the purpose. The location is convenient to other air force establishments, and to Melbourne. The area is 150 acres, which is nearly all flat. There is a sufficient area of flat country for a landing ground.

There will be no need for special expenditure for levelling. The site is ten miles from Melbourne, thirty miles from Geelong, and six miles from Point Cook. The question of having the depot at Point Cook was considered, and comparative estimates were prepared. I concur in the estimates prepared by the Works and Railways Department. Between the two sites there was a difference of £60,000 in favour of Laverton. The additional cost of erecting the depot at Point Cook was mainly on account of the necessity for providing a railway. The cost of the site at Laverton is £3,528. The cost of the buildings would be rather more at Point Cook than at Laverton. If Point Cook were decided upon the first step would be to build a railway, so that the cost of getting labour there would be as low as possible. The difference between the cost of labour at Point Cook and at Laverton would not be very much. The proposed future connexion between Laverton and Point Cook will be by road transport. I am satisfied that there will be no need for railway communication between those two points, having regard to proposals at present in view. The road communication between Geelong and Melbourne is quite satisfactory. It is one of the best roads in the State. The existing conditions for water supply at Laverton are that there is a 6-inch main running off the end of the Metropolitan Board of Works' 6-inch main at Newport. Then there is a 4-inch pipe right through to Point Cook. This passes alongside the Laverton site. This pipe belongs entirely to the Department, except the first portion of the 6-inch main. It is now proposed to start a 6-inch main from the 12-inch or 15-inch main at Newport, and take it through to Laverton. The 4-inch main will be taken up and relaid from Laverton to Point Cook. There will then be two 4-inch mains from Laverton to Point Cook, and a 6-inch main from Newport to Laverton. This work would have to be done wholly at the cost of the Commonwealth, and there would be no tappings off the main for any other purpose. It is proposed to provide a 50,000-gallon overhead tank at Laverton for fire protection purposes, and, in addition, a 50,000-gallon tank for domestic supplies. One of these tanks will be kept solely for fire protection purposes. As that will give only a very small head of water, it is proposed to install two booster pumps, which will give a pressure from 80 to 100 lbs. Leading from the tank will be 9-inch mains, with 5-inch and 4-inch reticulation pipes for fire purposes. The booster pumps will be electrically driven, and will be controllable at the pumps themselves, and at several points in the depot. There has been some discussion as to whether a 50,000-gallon tank is sufficient for the purpose. The Commonwealth Fire Board, whose consultant is the Chief of the Metropolitan Fire Brigades Board, has decided that it is quite sufficient. As the scheme is a progressive one, it will be necessary to bear this aspect of the matter in mind in the future. A 9-inch main from the tank will give an ample pressure for all requirements, however much the area may grow. The top of the tanks will be about 50 feet, and the bottoms about 40 feet, above the ground. I do not think any detailed drawings have been made of the fire arrangements. The electric mains to feed the pumps will not pass near any of the buildings. The first building which is contemplated is for aeroplane stores. Its area is 272 feet by 176 feet, with concrete foundations and a 6-inch concrete floor laid on the ground. It is preferred to have the floor on the ground rather than to raise it. It will be 3 ft. 3 in. above the railway track, and level with the railway platform. The outside walls will be 11 inches hollow brick, with 18-inch brick piers. Steel stanchions and beams will support steel saw-tooth roof trusses. This will give continuous south lighting over the whole store. There will be a corrugated iron roof, and inside galleries of timber for the storage of small parts and accessories. The height from the floor to the roof will be 20 feet. This is necessary to give room for the crane to operate. This is the only building which it is proposed to fit with Grinell sprinklers. The crane will be electrically driven. I do not know that the type of crane has been determined upon. Most of the goods to be handled are already stored at Spotswood, and we know their character fairly well. There will be natural lighting from the roof, and lighting high up on the ends of the building. There will be two other buildings 50 feet away. One will be a workshop and the other a general store. It is generally recognised that 50 feet between buildings is a reasonable fire protection. It is estimated that the cost of the stores building will be £30,000. I have no details of the estimate. The estimate does not include the cost of the crane, but it does include runners for the crane. The next building to be erected will be a mess room for 256 men, and a sergeant's mess, quarters for 40 men, and three married officers' quarters. The men's mess will be of Baltic weatherboards with corrugated iron roof, Baltic flooring, and a concrete floor in the kitchen. The mess room will measure 76 feet by 42 feet, and the kitchen 30 feet by 22 feet. With sculleries and stores, &c., attached. The sergeant's mess will be 40 feet by 24 feet, and will be connected with a kitchen by a covered way. The cost will be £5,800. Similar buildings are proposed to be erected at Point Cook. The kitchen equipment, to provide for 256 persons, will consist of one steam boiler, one centre range, one carving table, one steam cooker, four boiling pans, and hot water supply, using steam mixing valves. The estimated cost of this equipment will be £1,000. The estimated cost of the mess room and kitchen complete is £8,800. It is proposed to deal with the sewage by means of a tank in which the sewage will be partly broken down, and from which it will be pumped to the main discharge sewer for the City of Melbourne, about 12 miles from the site. It is not practicable to pump the sewage to this sewer without first breaking it down in a tank. Pumping is unavoidable because the tank is approximately 40 feet below the level of the sewer. There is a similar system at Point Cook, except that the sewage there goes out to sea. The three married quarters will include the commanding officers' house, which will be a five-room timber building with kitchen, bath, sleep out, wash house, and front verandah, £1,870; married officer's house, £1,385; and two married non-commissioned officers' houses at £1,320 each, £2,640. Wool has been decided upon for these houses because of its lower cost. The married non-commissioned officer's houses would probably cost 15 or 20 per cent. more if constructed of brick. The total cost of buildings in the first year will be £44,835, which will comprise aeroplane stores building, £20,000; mess room, £5,800; quarters for 40 men, £3,120; commanding officer's quarters, £1,870; married officer's house, £1,385; and two married non-commissioned officers' houses, £2,640. The work for the second year will comprise: Workshop building, £14,300; general stores building, 200 feet by 120 feet, £13,550; quarters for sixteen men, £2,300; quarters for 40 men, £3,120; two married officers' houses, £1,385 each, £2,770; two married non-commissioned officers' houses, £1,330 each, £2,640; single officer's quarters, £6,915. In the third year the work will consist of a hangar, £5,060; service transport building, £15,000; salvage store and laundry, £1,200; boiler room, £2,800; quarters for 16 men, £26,900; married officer's house, £1,385; two married non-commissioned officers' houses, £2,640; and guard house, £500. In the fourth year the work to be undertaken will be transport building extension, £12,500; quarters for 16 men, £2,300; quarters for 40 men, £3,120; two buildings at £3,120 each, £6,240; married non-commissioned officers' houses, two buildings at £1,330 each, £2,640; two temporary huts for eight officers, at £545 each, £1,090; six temporary huts for 24 men, to be removed from Point Cook and re-erected at Laverton, £2,100; mess room and kitchen for service squadron, £3,040; workshops, £3,500; two service hangars, at £5,060 each, £10,120; two service hangars, with offices attached, at £5,785 each £11,570; commanding officer's house, service squadron, £1,870.

lavatories and latrines, £740. The total estimated expenditure is—First year, £44,835; second year, £46,615; third year, £34,305; fourth year, £67,730, making a total of £182,485. The civil engineering services include water supply, £36,600; sewerage, £15,120; railway siding, £4,650; fencing, £2,087; roads £16,743; footpaths, £1,800. It is proposed to erect a high, galvanized iron fence round the stores building. There will be stored there some valuable articles which will be very liable to be stolen, and, if stolen, could be readily disposed of. These include watches and photographic outfitts. The workshops, stores, and railway siding will be within the one fence. The roads will have to take very heavy transport. We use 3-ton lorries which, when fully loaded, weigh $\frac{3}{4}$ tons on the back axle. The estimate covers roads within the depot only. The road within the depot will run from the entrance at the crossing of the road to Point Cook to the western boundary of the property. It will then follow the western boundary, and go practically right round the stores building, and in between the stores and the workshops. The road is about 70 feet wide in front of the hanger, and about 20 feet wide in front of the other buildings. It will be made of reinforced concrete. It will not be as good as the roads in the centre of Melbourne, but will be very similar to those now being put down in Richmond. The concrete will be laid direct on the ground. Reinforced concrete is supposed to make the best of roads. Sometimes a carpet of asphaltum is laid on the top of it. It is usual to use about 3 inches or 9 inches of concrete on an earth bottom. In Richmond they are using a layer of ash first, but these are only necessary when there is a clay soil. I do not think ashes will be required at Laverton. Water pipes and sewers will be laid under the channels at the side of the road. If asphalt is placed on top the concrete need not be thicker than about 6 inches. There will be a metalled road in front of the quarters. The estimate does not include the roadway between Point Cook and Laverton. That is now being made by the State. It will be a similar road to that between Melbourne and Geelong. The Commonwealth is contributing towards the cost of that. Well-made roads within the depot are necessary. All our transport is done by heavy lorries. Some materials will come in by rail, but most of them by rail. Heavy lorries must have a good road to carry them. A better class of road is required near the workshops, because there is a lot of turning and stopping done there. The quality of road necessary there is not required outside the depot. An expenditure of £1,200 will be necessary to remove stones and level the landing area. The mechanical engineering services will include a 5-ton overhead travelling crane, £2,200, and the sprinkler system in the main stores building, £1,700. There will be a watchman at night within the stores enclosure. He will be connected by means of a watchman's clock with the guard room, where there is always a permanent guard. The fire alarms will also be connected with the guard room. If the watchman fails to push a button at certain hours the guard room is automatically rung up. The heating and ventilation system for the dope shop is estimated to cost £1,200; installation of machinery for workshops, £2,100, excluding the cost of the machinery; extraction plant for the removal of sawdust and shavings, £500; laundry equipment, £1,550; cooking plant in the main kitchen, £1,000; hot water supply to the quarters, £1,000; ice-making plant, £600; kitchen cooking equipment for the single officers' quarters, £900; and hot water supply to quarters, £200. For the service squadron the kitchen equipment is estimated at £1,000, and hot water supply for lavatories at £650. Regarding electric power, we have at present a main from Newport to Point Cook, which passes within a few hundred yards of the corner of the Laverton site. Arrangements are being made for the Electricity Commissioners to take over this main between the high-tension main which crosses it and Point Cook. If that is done the Electricity Commissioners will attend to the maintenance of the line and the transformer station at the

depot, and we shall handle only the low-tension section. Electric mains and services are estimated to cost £1,800; a sub-station complete, £2,800; watchman's clock and fire alarms, £300; installation of fire pumps, £1,840; supervision and contingencies, £600. The septic tank will be situated on the southern boundary of the site between the quarters and the stores. It will be simply a tank. It is not proposed to put in aerobic beds. The tank will be closed in, with a vent carried high into the air. It is being designed on a scale that will be sufficient for all the buildings contemplated. The estimate for water supply does not include hot water services, but is for the 6-inch main to the depot and the 4-inch main beyond. I do not think there is any special objection to constructing two-story buildings of wood. We are not afraid of white ants. It is proposed to use hardwood and Baltic timbers. The framing will be of hardwood, and the flooring, in most cases, of Baltic. It is very difficult to get Western Australian flooring at the present time. Baltic flooring is cheaper and easier to work. I consider jarrah much superior. I have not personally prepared any estimate for these buildings in hardwood, weatherboards, and flooring. The Works and Railways Department will be responsible for the construction of the buildings. I act as an adviser to the Works and Railways Department and the Air Force. I would prefer hardwood to softwood, and would prefer jarrah if possible, particularly for floors. I do not think there is much difference between them from the point of view of fire risk. Wood buildings are dangerous in that respect, whether built of soft or hard wood. Jarrah posts of large dimensions are practically fire resisting, but when they are small there is very little difference between them and soft woods. Baltic weatherboards have a life of 50 years if they are well looked after.

40. *To Mr. Mathews.*—The Metropolitan Fire Brigade has been consulted with regard to fire protection. The consultant to the Commonwealth Fire Board is the Chief Officer of the Metropolitan Fire Brigade. It is calculated that a 50,000-gallon tank will be sufficient for fire-protection purposes. It is not considered necessary to have a pump on the 6-inch pipe supplying the tank. The 4-inch water main to Point Cook was not proposed when the comparison placed before the Committee was drawn up. More expenditure than that stated would be necessary if the depot were placed at Point Cook. It would cost £12,000 more for the water supply for Point Cook than for Laverton. A number of the 256 men who have been mentioned will only mess at Laverton, while living elsewhere. It is proposed to provide for 256 men, but not in the first year. In the fourth year there will be sleeping accommodation for that number of men. At the end of the fourth year there will be eight married quarters, and a number of married men will live in town. There is provision at Point Cook for about eight married quarters. The men are still living in the huts at Point Cook, and a contract is in progress for the erection of a permanent barracks. The Laverton programme will not affect the erection of buildings at Point Cook. It is considered necessary to have both fire sprinklers and watchmen. The sprinklers will be provided only in the main stores building. A watchman would be necessary in any case for the prevention of theft. Only one watchman will be on duty at a time.

41. *To Senator Lynch.*—I am not a member of the Air Board. I am not connected with the Defence Council. In the selection of the site I acted in consultation with Wing Commander Williams. We were confined to an area to the west and south-west of Newport. I was consulted in regard to the building aspect only. The strategic aspect was a matter for the Air Council. The close proximity of an area reserved for noxious trades will not concern us for a long time. It is difficult to say at the present time whether it is wise to place the depot close to an area reserved for noxious trades. It is very difficult to say how the area will develop. I do not know that proximity to noxious trades interferes with the health of

men, but it certainly does with their convenience. I admit that some chemical works may be removed from city areas for hygienic and health reasons. I am unable to say whether the Imperial Authorities could give any advice about this site. Air Force officers in that country have not had much more experience than we have had in Australia. During the war we had men equally as capable as the best of them. Prior to the war they may have had a few years' more experience than we had. I do not think there is the slightest need for us to look for light and guidance from them. We would consult them, of course, with regard to the general air service policy, but not in regard to the selection of a particular site. We have a trained personnel here quite capable of selecting a site. The Imperial authorities have not the same facilities as we have for studying local conditions. They might consider the matter for a few days or a few weeks, and their decision would be more likely to be wrong than ours. The Laverton depot will not necessarily be the main base for the Commonwealth. It will be the main base for Victoria. I cannot say where the second base will be. There will be a central authority, but not necessarily a central depot. This depot, even if it is not accepted as a model, will greatly influence the construction of future depots. We have military stores in Melbourne, Seymour, Liverpool, and Queensland. There are no stores at the Central Head-quarters in Melbourne. The head-quarters will probably go to Canberra shortly, but we are not likely to have a store there. The Naval Head-quarters of the Commonwealth are in Victoria Barracks, Melbourne, but the head-quarters of the Fleet are in Sydney. The lay-out of the buildings at Laverton conforms to the latest experience in England regarding fire protection. Such buildings would suffer greatly in case of fire. Each of the married men's quarters has a 60-foot allotment. To separate the buildings further would add greatly to the cost of services.

42. *To Senator Reid.*—The 20-foot walls in the store building are to provide room for the crane to operate. The central passage will be used for loading and unloading, and while those operations are proceeding it is desired to be able to load into any part of the shed. There must be sufficient room to lift a package above another on which men are working. The height of the ceiling is about 7 feet.

43. *To Senator Lynch.*—I think there was a great deal of preliminary discussion by the authorities who decided the question regarding the strategic aspect of the site, but I think in the long run they all reached an agreement. The size of the site is ample. The buildings could be more than doubled while still leaving the space required by the Air Force for landing

(Taken at Melbourne.)

MONDAY, 24TH SEPTEMBER, 1923.

(Sectional Committee.)

Present:

Mr. JACKSON, in the Chair;

Senator Barnes | Mr. Mathews.

Mr. Mackay

Thomas Hill, Chief Engineer, Department of Works and Railways, sworn and examined.

44. *To Mr. Jackson.*—The total estimated cost of the proposed air-craft depot at Laverton is £226,838, of which £182,245 will be spent on architectural services and approximately £215,000 on engineering services. This expenditure is to cover a period of four years. Mr. Murdoch will deal with the architectural services to-morrow. I shall deal with the engineering services in their respective order. I hand in a copy of the estimates, with a description of the various works

and buildings, and, in addition to the plans forwarded to the Committee, through the Parliamentary reference, I also submit plans 11, 12, 13, 14, 15, and 16. Plan 11 is a general plan showing the relative positions of Williamstown, Laverton, the railway siding, and the proposed air-craft depot adjacent thereto, and also the flying school at Point Cook. The existing water supply to Point Cook is taken from the Board of Works mains from the end of a 6-in. pipe about a mile from the Newport railway station. It is taken thence in a 4-in. cast-iron pipe, right along the railway line to Laverton, a distance of about 7 miles, and thence over to Point Cook, another 5 miles, making 12 miles in all. That 4-in. cast-iron main was laid down in connexion with the original flying school, and for its needs only, but for the air-craft depot it will be necessary to increase the supply, and it is proposed to take up the 4-in. pipe for the distance of 7 miles from Newport to Laverton, and replace it by a 6-in. cast-iron main which will not take off from the end of the 6-in. reticulation, which supplies some houses, but will take off from a 15-in. and a 12-in. main coming direct from the existing reservoir. Thus the very best supply, obtainable through a 6-in. main will be insured. The 4-in. pipe which will be taken up will be re-laid from Laverton to Point Cook as an extra 4-in. main to serve the flying school, thus improving the supply at Point Cook. The Board of Works and the Railway Department have agreed to this scheme, the estimated cost of which is £36,500, of which the new 6-in. main will absorb £25,000, the rest of the cost being made up by taking up and re-laying the 4-in. main, £1,800, by building two 50,000-gallon reinforced concrete tanks, £3,400, and by the internal reticulation for domestic purposes and fire prevention. The last-mentioned cost will include about half-a-mile of 9-in. cast-iron piping, nearly a mile of 6-in. piping, and 400 feet of 4-in. piping, together with eighteen fire hydrants and the necessary valves as shown on plan No. 12. Two tanks similar to those proposed to be installed are in existence at Point Cook. They will be situated near the entrance to the property from the railway. They will be elevated to give a minimum head of 40 feet from the underground water table. One will be kept wholly for domestic purposes, the other will be kept full for the prevention of fires. It is proposed to install electrically-driven booster pumps on the 9-in. main as it emerges from the tank reserved for the prevention of fire. These pumps can be started by any one pressing a button in any part of the property, just as one would press a fire alarm. There will be two of them for the reason that it is better to have two of a small size than one of a large size, so that in the case of emergency there will be stand-by. We hope shortly to have in use a similar booster electrically-driven pump system at Point Cook, where we are faced with the very same difficulty, that on a very hot day we may not have a decent pressure in the main extending for a distance of 12 miles. It is very advisable to have not only plenty of water, but also a good pressure. The system is being installed at Point Cook on the advice of the Fire Brigades Board, of which Mr. H. B. Lee is our consultant. It is a novel application, and Mr. Lee, on his visit abroad, will endeavour to see if he can discover such system in operation anywhere else. However, we have not the slightest doubt as to its capacity to do the work. When a person presses a button for a fire alarm, he will not only call the alarm, but also start these pumps. We take the 9-in. pipe from the reinforced concrete tanks and break them down to two 6-in. mains, one on either side of the stores and factory. We will also have pillar hydrants every hundred yards, with hoses attached, ready for immediate use in case of fire. Similarly in the domestic part there will be another 6-in. main with pillar hydrants every hundred yards apart, and hoses attached. There will be eighteen pillar hydrants in all. It is estimated that for the 300 people who will form the population of the air-craft depot, the service provided will be ample for domestic and fire

protection purposes. The total cost, as I say, is £36,600. The Board of Works were approached and asked if it would be possible for them to extend their mains to Laverton, but there is really nothing to justify their doing so. They have a main to Werribee following the main outfall sewer, but that is already overloaded, and to increase its size would mean a very heavy expenditure. Furthermore, it would not be as good a service as we are providing by taking our own 6-in. main directly off the 16-in. and 12-in. main. We have no intention of allowing any persons to take a service off our main. It will be kept specially for the depot. Should the latter extend in size further storage tanks will have to be added. The ultimate proposal is to have four of these tanks, two for fire purposes and two for domestic purposes. The additional tanks will not be built until the project increases beyond its range of 300 people. It is eminently desirable to have water-carried sewage, and so we have designed a scheme, shown on plans 11 and 13, to carry the sewage into the outfall sewer of the Board of Works. The country is pretty flat. If we desired to dispose of effluent from a septic tank we would have a long distance to reach Port Phillip. The shortest distance, via Skeleton Creek, would be 5 miles, but the creek passes through country in which there is some grazing, and as the treatment of sewage effluent, even under the best conditions is liable at times to create a nuisance, and as the Board of Works outfall sewer to Werribee passes the depot about a mile to the north, it was thought better to collect the sewage through the ordinary reticulation shown in red on plan 13 through 6-in. and 9-in. pipes into a pump-pit, and discharge it from that spot by means of an electrically-driven pump through a 6-in. cast-iron main, a distance of about 1½ miles into the outfall sewer. Permission has been sought from the Board of Works to do this, and they have granted it subject to a small charge for the service they will give, allowing us to discharge into their sewer. The charge will possibly be about £75 per annum. The method suggested will get rid of any danger of polluting water-courses, or other troubles likely to arise. The country is too flat to permit of the flow of the sewage by gravitation; in fact there is a steady rise from the depot site to the outfall sewer. The depot is approximately 33 feet above sea-level at the south-east corner. The outfall sewer is about 70 feet above sea-level. There will thus be a lift of 40 feet, or allowing for the friction in a 6-in. pipe, about 50 feet. The general slope of the country in the depot is from north-west to south-east. The Board of Works have asked us to give a little settlement to the sewage before pumping it, so that it may approach the character of the sewage that is flowing along their own outfall sewer, that is to say, we shall give it about two hours' settlement so that we shall not be discharging actually crude sewage into their sewer. The paper will be dissolved in that time, and the sewage will simply be liquid with slight flakes in it. The estimated cost of the sewerage is £15,120. The 6-in. rising main will cost £7,000, the collecting pits £3,000; and duplicate 6-in. pumps £400. In the Board of Works had not helped us we should have been obliged to adopt a system of expensive treatment tanks. The quantity of sewage estimated to be pumped is approximately 15,000 gallons a day. The total estimated cost of the electrical services is £13,960. Before going into the details of these services I shall deal with the source of supply. Point Cook is now supplied with current from the Newport sub-station of the Victorian Railway Department. From that sub-station we have 12 miles of high pressure electrical mains running along the Geelong main road to Laverton, and thence due south to Point Cook. But as the Victorian Electricity Commissioners' high-tension mains from Morwell cross our mains at a point on the Geelong-road, near the Kororoit Creek, we now propose to hand over ours to the Commissioners, at a valuation, and take a supply of current from them at Point Cook and Laverton,

thus enabling us to fall into line with the general scheme of distribution of current, and get rid of the cost of maintaining 12 miles of high-tension mains. The cost will not be any different. It will also fall into line with the Commissioners' scheme for supplying electricity to Werribee. In every way the new arrangement will be an advantage. It would be too costly to put in our own generating plant, in comparison with taking a supply from the Electricity Commission. Our requirements should not exceed 50 kilowatts at Point Cook and 50 kilowatts at the air-craft depot. On plan 14 is shown the design of the high-tension mains and the proposed sub-mains to the various buildings, and also the transforming house. The light and power installations for the various types of buildings would include the following equipment:—

(a) Workshops—

1. Industrial general lighting.
2. Hand lamps for local examination purposes.
3. Power points for portable machine tools.
4. Six motors to drive line shafting.
5. Two motor generator sets for charging batteries.

(b) Stores—

1. Industrial general lighting.
2. Hand lamps for local inspection.

(c) Hangars—

1. Industrial general lighting.
2. Hand-lamps for local inspection purposes.
3. Power points for portable machine tools.

(d) Offices—

1. Ordinary direct lighting.
2. Power points for radiators.

(e) Living Quarters—

1. Ordinary direct lighting.
2. A few semi-indirect points where specially required.
3. Power points for radiators, irons, &c.

(f) Street Lighting—

1. Brackets mounted on distribution poles, each point being separately switched at the pole.

The estimated cost for internal wiring and lighting of buildings inside the actual depot is thus £6,620. The mains and services from the sub-station to the various buildings will cost £1,800. A sub-station, including the necessary high-tension control apparatus, transformers, and all necessary low-tension switchgear, will cost £2,800. A combined watchman's clock and fire alarm system in the workshops and stores area is thought necessary to provide, in conjunction with the installation of fire alarm points, for the safeguarding of the depot. The recording instruments would be located in the guard-room at the south-east corner, and would therefore be under the constant supervision of the guard on duty. The estimated cost of this installation is £300. The installation of the two fire booster pumps located in the rooms under the water tank, similar to those being installed at the flying school, and equipped with ten control switching points, would cost £1,840. With some items for contingencies, these figures make up the estimated cost for electrical services, namely £13,960. Although the total expenditure at the depot is to be spread over four years, it is proposed to spend the money on the engineering services in the first and second years, because it is advisable to have water, sewerage, and lighting at the earliest possible period. The estimated cost of the railway siding is £4,650. That estimate has been furnished by the Victorian Railway Department. The siding does not need to go into the Laverton station, half-a-mile away. It gives us direct access to the main line, provision being made for future duplication of that line to the north and for electrification. We should have the length of siding we require, and the Department will lease to us a piece of ground to the north of the railway line so that we may enclose the siding. Altogether it is a very advantageous proposition for both

parties. We shall be in a position to bring our stores and workshops right alongside the railway line, and to get quick service to Melbourne for any goods. As regards passenger traffic, the main Laverton railway station is only half-a-mile away, and there is a very fair train service. One of the main reasons for selecting this site was the good railway communication and the quick service. Point Cook is 5 miles from the railway, and does not lend itself to bringing men out from the city in the morning and returning them at night. The depot will be only 14 miles from Melbourne.

The estimated cost of the roadways is £16,743. The roads in front of the workshops will be 33 feet wide, and those in front of the hangars 70 feet wide, with a shallow drain formed in concrete. The road to the west of the stores will be 30 feet wide; that between the transport sheds and the hangars 20 feet wide; that between the workshops and the hangars the full width, with concrete in all cases carried to the doorways. The other roads will be 20 feet wide. The road from the entrance gates to the workshops and all roads in the workshops block will be constructed to carry 5-ton loads. The other roads will be constructed to carry ordinary main street traffic. The cost is high, but the area to be covered is considerable.

It is very essential to have communication open at all times between the various buildings. The footpaths are to be 6 feet wide along the roads and for general access to the buildings. The estimated cost of the footpaths is £1,800. Concrete kerbing and channelling will follow the road footpaths, to take the storm-water, and they will be graded to discharge through a culvert under the railway. The storm-water is £16,743. The roads in front of the workshops will be 33 feet wide, and those in front of the hangars 70 feet wide, with a shallow drain formed in concrete. The road to the west of the stores will be 30 feet wide; that between the transport sheds and the hangars 20 feet wide; that between the workshops and the hangars the full width, with concrete in all cases carried to the doorways. The other roads will be 20 feet wide. The road from the entrance gates to the workshops and all roads in the workshops block will be constructed to carry 5-ton loads. The other roads will be constructed to carry ordinary main street traffic. The cost is high, but the area to be covered is considerable.

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(c) Laundry—

Steam laundry equipment for 200 persons, and consisting of 1 steam boiler, 1 centre range, 1 carving table, 1 steam cooker, 4 boiling pans, and hot water supply, using steam-mixing valves. Estimated cost £1,550

Depôt Barracks

(a) Kitchen—
Steam cooking plant for 256 persons, and consisting of 1 steam boiler, 1 centre range, 1 carving table, 1 steam cooker, 4 boiling pans, and hot water supply, using steam-mixing valves. Estimated cost £1,000

(b) Quarters—
Hot water supply to quarters, using steam from kitchen boiler and carrying steam-pipe reticulation to each building, with mixing valves on baths and lavatory basins. Estimated cost £1,000

(c) Ice-making Plant—
Having a capacity of 10 cwt. per twenty-four hours, electrically operated. Estimated cost £600

Officers' Quarters.

(a) Kitchen—
Steam cooking equipment for 60 persons, and consisting of 1 steam boiler, 1 centre range, 1 carving table, 1 steam cooker, 4 boiling pans, and hot water supply through steam-mixing valves. Estimated cost £900

(b) Quarters—
Hot water supply to baths and lavatory basins, using steam from kitchen boiler and steam-mixing valves. Estimated cost £200

Service Squadron.

(a) Kitchen—
Steam cooking equipment for 130 persons, and consisting of 1 steam boiler, 1 centre range, 1 carving table, 1 steam cooker, 4 boiling pans, and hot water supply through steam-mixing valves. Estimated cost £1,000

(b) Lavatories—
Hot water supply to showers and lavatory basins, using cast-iron boiler, storage cylinder, and copper pipe reticulation. Estimated cost £650

Total estimated cost £14,600

Sprinklers will be installed in accordance with the usual practice in all defence store buildings. In regard to the dope shop, the dope will not be made in that building, but it will be brought there to be applied. It is very necessary to ventilate the building freely, and so we are allowing for twenty changes of air per hour. The system is similar to the one already installed at Point Cook. It is very necessary to have an ample supply of hot water in the quarters. The men who will be working among machinery will be covered with oil, grease, and grime, and as the climate is pretty cold in the winter it is essential to have a hot-water service. An ice plant is also essential. For the present, we have been asked to provide for 130 men, but the service could easily be extended, if necessary, in the Service Squadron. The items I have mentioned comprise the £114,351 for engineering services, of which it is proposed to spend practically £100,000 in the first and second years, because the services will be essential for the installation of even a part of the project. I went

through the engineering plans with the Director of Works and Major McLean, of the Air Force. I am responsible for the water and sewerage proposals, and in regard to the mechanical and electrical equipment, I drew up the plans in touch with the Air Force officers, and accept responsibility for them. I am satisfied that the saw-tooth method of lighting will give proper ventilation for the workshops. The workshop machinery shafting is to be placed under the floor. It is better to do this wherever possible. For one thing, it gives a firmer foundation. There will be overhead shafting in the machine shop, but it will not have the same load as it is necessary for the machinery in the wood-work shop to carry, and it will not run at the same speed. In the machine shop, you can have an overhead drive, whereas it is better to have an underground drive in the wood-working shop. Another advantage in having the shafting underneath is that the workmen can get right around their machines. Judging by our experience at Point Cook, I would not have anything but reinforced concrete roads in an air-craft depot. In the handling of aeroplanes, roads with spall bottom and a tared macadam top will not stand the twisting and straining. It is not direct traffic, such as one has on an ordinary road. The machines are twisted about a good deal, and in doing so the road surface is badly cut up. It is only a waste of money to have anything but reinforced concrete roads in an aircraft depot.

44. *To Mr. Mackay* The engineering and mechanical services will cost—

| | | |
|---------------------------------------|---------|----------|
| Water supply | ... ... | £36,500 |
| Sewerage | ... ... | 15,120 |
| Railway siding | ... ... | 4,650 |
| Fencing | ... ... | 2,087 |
| Blinds | ... ... | 16,743 |
| Footpaths | ... ... | 1,800 |
| Kerbings, channeling, and storm-water | ... ... | 3,606 |
| Grading | ... ... | 1,200 |
| Electrical services | ... ... | 13,960 |
| Mechanical services | ... ... | 14,600 |
| Contingencies | ... ... | 4,085 |
| Total | | £114,351 |

The 6-in. water main will run alongside the railway line for 7 miles. We shall not allow any one to tap that main, because we do not want our supply to be interfered with at a critical moment. The only concession we are making is to the Railway Department. We are allowing them to take of 1-in. service for the stationmaster at Laverton. We could not expect the Board of Works to lay the main. If we consumed 40,000 gallons a day, that would mean a revenue of £600 a year to the Board, but as the cost of laying the main would be £25,000, and as they would have also to supply the water, and make allowance for headworks and storage charges, their net return would not represent more than £200 a year. A 6-in. main will be quite sufficient for our purposes for a long time ahead. It might be advisable to have a stand-by electrical plant in case of interruption to the supply of current from the Electricity Commissioners. I would not be opposed to having one, but I do not think it would be necessary. While there might be a stand-by plant to take up part of the load, say, one sufficient for lighting purposes, which might not be used more than once a year, it would not be economical to run that same plant for the whole year round. A plant for stand-by purposes only would not be expensive, and there is such a plant in operation at Point Cook, but I would not recommend putting up a big stand-by plant sufficient to run all services. The railway siding could be extended quite easily at either end. On the straight, the siding proposed will have a run of 660 feet. There is plenty of bluestone handy for making the roads. The natural lay of the land lends itself for road formation, but as it

is so flat it is necessary to put in large pipes to take off the storm-water.

45. *To Senator Barnes*—There will be two 4-in. pipes to Point Cook, but the 6-in. main will not be feeding all the time into either of these pipes. It will give an ample supply to the air-craft depot, and also help considerably to get water to Point Cook during the night. One 6-in. pipe is almost equal to two 4-in. pipes. We shall take advantage of the night to fill the reservoirs. Nothing will happen if the booster pumps are set at work, and there is no one to work a hydrant. There will simply be an additional pressure, but the pipes will stand a greater pressure than the pumps will impose on them. There will be a characteristic pressure of 150 lbs., and beyond that the pipes will simply burst up.

46. *To Mr. Mathews*—Mr. Lee is strongly of opinion that sprinklers are necessary as well as night watchmen, and I would not venture to express an opinion against that of a man of his experience and calibre. In a building containing machinery worth £250,000, and difficult to replace, it is worth while installing sprinklers at a cost of £1,700, and stopping fires in the bud. The roads will be made of bluestone, but instead of being tared the metal will be bound together with cement. Our experience at Point Cook shows that it is essential to have roadways more durable than those already there. Reinforced concrete roads will stand the test.

47. *To the Chairman*.—In the store the travelling crane will run on its own supports. The crane will be Australian-made. In fact, pretty well everything I have mentioned will be Australian-made. There will be no difficulty with the pumps on the water towers. The proximity of the depot to the noxious trades area to the east and north was considered when the site was chosen. I do not think it will have any detrimental effect. You might as well take into consideration the fact that the site is close to the outfall sewer, which is not covered for some distance. Noxious trades properly carried out do not give trouble.

48. *To Mr. Mackay*.—The tanks will give a pressure of about 25 lbs. to the square inch. We have them at Point Cook, but there we have the advantage that the ground slopes away from them, whereas at Laverton the ground to the west rises to a height of nearly 7 feet above the level on which the tanks will be situated, and the rise to the north is about 11 feet. One tank will be kept full all the time for fire purposes. Mr. Lee says that water under full pressure is of best value to him within the first fifteen minutes after an outbreak. If he has not the fire under control by then, there is something wrong somewhere. Four hoses would each want about 120 gallons a minute. Under the pressure of these pumps we would give 150 lbs. to the square inch. The 6-in. reticulation mains would enable four hoses to be operated. This question has been studied with a full knowledge of the conditions existing at Point Cook, where an exactly similar system is operating.

(Taken at Melbourne.)

(Sectional Committee.)

TUESDAY, 25th SEPTEMBER, 1923.

Present:

Mr. JACKSON, in the chair;
Senator Barnes, | Mr. Mathews.
Mr. Mackay.

John Smith Murdoch, Chief Architect, Department of Works and Railways, Melbourne, sworn and examined.

49. *To Mr. Jackson*.—I am responsible for the design of the proposed buildings. The plans have been drawn by the architectural staff of my Department after consultation with officers of the Defence Department. The buildings are designed to meet the views

of the aviation officers, both as to the style of structure and relative positions on the site, and I presume that evidence has been given as to the necessity for their erection. The intention is to spread the constructional work over a period of four years, and the total estimated cost of the buildings, excluding engineering services, is £182,485. In the first year it is proposed to expend £44,385, in the second year £45,615, in the third year £34,305, and in the fourth year £27,730.

First Year's Building Programme.

The principal building to be erected in the first year is for the aeroplane stores. The dimensions of this building will be 272 feet by 176 feet. The foundations will be of concrete, with a 6-in. concrete floor, 11-in. hollow brick external walls, with 18-in. brick piers, steel stanchions and beams supporting steel saw-tooth roof trusses, giving a continuous south light. The roof will be of corrugated galvanized iron, on wood purlins. The inside galleries will be of timber, and the storage bins will be on two levels. The height from floor to underside of beams will be 20 feet. All window frames, sashes, &c., will be of wood, and the building will be fitted with Grinnell sprinklers. Offices will be situated at the south-east corner, and there will be provision for a 6-ton travelling crane running north and south through the building to the railway platform. The estimated cost is £30,000. The construction is as economical as we can adopt, consistent with the erection of an efficient building. No architectural features are provided for. Nevertheless, the building will be symmetrical, and should be pleasing in appearance. The second building in the first year's programme will be mess-rooms for 256 men and for the sergeants' mess. This will be of hardwood framing and hardwood weatherboards, the roof of corrugated galvanized iron, and the floor of hardwood, but the floor in the kitchen will be of concrete. The inside walls and ceilings will be lined with 34-in. by 4-in. hardwood. The men's mess-rooms will be 76 feet by 42 feet, and the kitchen 30 feet by 22 feet, with sculleries, stores, &c., attached. The sergeants' mess-rooms will be 40 feet by 24 feet, connected with the kitchen by a covered way. The estimated cost is £5,800. The third building in the first year's programme is intended as quarters for forty men. It will be 69 feet long by 41 feet wide, timber and weatherboard construction, two storeys in height, with hardwood floors, galvanized corrugated iron room, and tar paving to the ground floor verandahs. The ceiling will be 10 feet high, and the necessary lavatory and wardrobe accommodation will be provided on each floor. The walls and ceiling will be lined inside with 34-in. by 4-in. hardwood. It is intended to remove the present barrack buildings from Williamstown, and utilize the materials for these quarters. The double bed-rooms will be 13 feet by 9 feet, with wardrobes built in, and the single rooms, intended for the sergeants, will be 10 feet by 9 feet. Estimated cost, £3,120. The next building in the first year's programme is the commanding officer's house, of timber and weatherboard construction, galvanized corrugated iron roof, 11-ft. ceilings, inside walls and ceilings plastered, five rooms, with kitchen, bath, sleep-out, wash-house, and front verandah, estimated to cost £1,870. The style of construction will be somewhat similar to the houses at Point Cook, but the rooms will be larger. For instance, the sitting and dining rooms will be 17 feet by 14 feet, and the hall 6 feet wide, with folding doors between. The principal bed-room will be 15 feet by 13 feet, with a wardrobe built in; the second bed-room will be 12 feet x 10 feet, another bed-room 10 ft. 6 in. x 7 ft. 6 in., and the kitchen 12 feet x 10 feet. In the first year we intend to build also a house for a married officer. The construction will be similar to that of the commanding officer's house, and the accommodation will be the same, but the rooms will be smaller, and the estimated cost £1,385. The last buildings included in the first year's programme are two houses for married non-commissioned officers, similar in construction to those already mentioned, and estimated to cost £2,660.

Second Year's Building Programme.

The principal building in the second year will be workshops 200 feet by 120 feet. The external walls will be of brick, with 18-in. brick piers, steel stanchions, and saw-tooth roof, similar to the aeroplane stores building to be erected in the first year. The building will be divided into various workshops, with machines, benches, shafting, &c., as shown in the plan, with offices, shop, and lavatory accommodation at the southern end. The partitions between the several workshops will be of wood, 3 feet high, and above that galvanized iron piping and wire netting. The height from the floor to the underside of roof beams will be 15 feet. The workshops' floors throughout will be of 34-in. by 4-in. jarrah, on 6-in. coke breeze concrete, and the total estimated cost is £14,300. The plan shows a departure from the ordinary steel saw-tooth roof arrangement in that at each end there will be the ordinary hip roof, and to insure sufficient lighting there will be an adequate number of windows in the end walls. This type of building is, I think, an improvement on the stereotyped saw-tooth style. Another building for the second year will be for general stores. This structure will be 200 feet long by 120 feet wide. It will be similar in general construction to the workshop buildings, and also subdivided into various groups by galvanized wrought iron pipe partitions, covered with wire mesh netting. Its estimated cost is £13,550. If necessary in future, the workshop and general stores buildings may be connected, and form one building. The next building to be erected in the second year is intended for quarters for sixteen men. It will be 84 feet long by 26 feet wide, constructed of timber and weatherboards. For this we shall utilize some of the materials from the Williamstown barracks. Lavatory and wardrobe accommodation and verandahs will be provided as shown in the plan. The estimated cost of this building is £2,300. Quarters for forty men will also be built at a cost of £3,620, utilizing material from the Williamstown barracks. The programme for the second year includes also two more houses for married officers, similar in construction to those to be built during the first year, and estimated to cost £1,385 each. In addition, we shall build two more houses for married non-commissioned officers, as already described, at a cost of £1,330 each; also the first portion of single officers' quarters, providing fourteen bed-rooms, with bathroom, reading room, dining room, and kitchen, capable of seating sixty, and kitchen connected with a covered way. This is estimated to cost £6,915, and completes the series of buildings designed for the second year.

Third Year's Building Programme.

In the third year it is intended to build a hangar, 100 feet long by 80 feet wide, with 11-in. hollow brick external walls, 3-ft. by 2-ft. 3-in. brick piers, and 6-in. concrete floor, steel roof trusses, and wood purlins, galvanized iron roofing, and side and end windows and skylights, as shown in the plan. The height from the floor to the underside of roof trusses will be 18 feet. There will be sliding doors at the front, with a steel curved track going inside the building. The estimated cost is £5,600. The next building is for service transport. This will be 350 feet long by 90 feet wide. The intention is to carry out construction of two-thirds of the main building. This will be utilized for the accommodation of motor vehicles. The piers on the north and south walls between the large deep openings will be 15-in. hollow brick, the end walls 11 inches hollow, with brick piers, internal cross wall 9 inches thick, with 18-in. brick piers, 6-in. concrete floor, steel stanchions, and beams supporting steel roof trusses, covered with galvanized corrugated iron on wood purlins. The north and south elevations will have the upper portion of the doors glazed, and fanlights over them. Windows will be placed in the east and west walls. The height from the floor to the underside of roof trusses will be 14 feet, and the height of the middle portion of the central bay 22 feet. The estimated cost is £15,000. The next building is the salvage store, and laundry and boiler

room. The salvage store will be 80 feet by 30 feet, the laundry 30 feet by 22 feet, and the boiler room 22 feet by 12 feet. The external walls will be of 11-in. hollow brick, with 16-in. hollow brick piers, and 6-in. concrete floors. The roof trusses of the salvage store will be of steel, covered with galvanized corrugated iron, on wood purlins, and the windows will be placed high, so as to give the maximum of storage accommodation. The laundry and boiler house will have rafters placed at 3-ft. centres, covered with galvanized corrugated iron on battens, and the undersides of ceiling joists will be lined. The estimated cost is £2,860. In addition, there will be three other buildings, providing quarters for sixteen men, at an estimated cost of £6,300; another married officer's house, to cost £1,385, two married non-commissioned officers' houses, at £1,330 each; and a guard-house, of timber construction, wood floors, and galvanized iron roof, estimated to cost £500. This gives a total of £34,305, and completes the programme for the third year.

Fourth Year's Building Programme.

In the fourth year we intend to complete the erection of the transport service stores, for the accommodation of motor vehicles, at a cost of £12,500. There will also be quarters for sixteen men, as already described, to cost £2,300; quarters for forty men, estimated to cost £6,240; two more houses for married non-commissioned officers, at £1,330 each; and temporary huts for eight officers. These will be removed from Point Cook and re-erected at Laverton. The construction is of hardwood, with wood floors, external walls and roof covered with galvanized corrugated iron, walls and ceilings lined with single-board dividing partitions, verandahs on one side, and conveniences at each end. The estimated cost is £1,090. We intend also to remove from Point Cook, and re-erect at Laverton, six temporary huts, giving accommodation for twenty-four men, the construction to be the same as for the officers' huts, but without the dividing partitions and verandahs. The total estimated cost of these huts is £2,100. Another building to be erected in the fourth year is a mess-room and kitchen for the service squadron. This will be 60 feet long by 30 feet wide. It will accommodate 120 men, and is estimated to cost £3,040. There will be also two workshops, 80 feet by 30 feet, with 11-in. hollow brick walls and 15-in. brick piers, roof principals of timber, and roof of corrugated galvanized iron, with underside of rafters lined. The floor will be of 1-in. jarrah, on coke breeze concrete, and the height from floor to underside of roof principals will be 11 feet. These buildings are estimated to cost £1,750 each, or a total of £3,500. Two other buildings intended as service hangars will be 100 feet by 80 feet, and of the same construction as already described in the third year's programme. These will cost each £5,060, or a total of £10,120. There will be also two service hangars, with, on one side, offices built of 11-in. hollow brick walls, with wood floor on coke breeze concrete, and concrete flat roof covered with malthoid. The total estimated cost is £11,570. The house for the service squadron commanding officer's house is estimated to cost £1,870. A building 40 feet by 18 feet will be fitted with showers and wash-troughs, and another building, 52 feet by 18 feet, is intended for the urinals and w.c. accommodation. These will be of hardwood framing, with concrete floors, and walls and roofs of corrugated galvanized iron. The estimated cost is £740, making a total for the fourth year of £57,730.

50. To Mr. Jackson.—I have not made an estimate as to the probable cost if the brick portions of the buildings were carried out in concrete, but the experience of the Department does not encourage the belief that concrete will be cheaper than brick. Quite recently, in the case of the new post-office at Mildura, where, owing to the difficulty of obtaining bricks and the relative ease of obtaining material for concrete work, we anticipated being able to carry out the construction in concrete, we found that on a work esti-

mated to cost between £10,000 and £11,000 the contract for a brick building was about £500 less than for concrete. About a year ago we had a similar experience at Canberra. A Melbourne contractor came along with a system of concrete construction, and the then Minister for Works and Railways (Mr. Richard Feder) was highly delighted at the thought that we had solved the difficulty of bringing down construction costs at Canberra. This contractor made a start, but had not proceeded far with the work before he had to surrender. We dealt with him as leniently as possible, returning his deposit, and taking over his materials at cost price. We had to finish the work ourselves, but not in concrete.

51. To Mr. Mackay.—In that case I think the contractor simply underestimated his costs. He had not very much capital, and we could not help him because he did not get far enough to justify progress payments on his work. I think that the chief difficulty with concrete men is that they overlook the comparatively large amount of expenditure necessary to set up the false work, and so underestimate their costs. If we can get bricklayers to lay between 500 and 600 bricks a day—and I think we can depend upon that output—the cost of brick construction will be cheaper than concrete every time. A Tasmanian builder is now anxious for us to take up his system of concrete, which, so far as I can ascertain, eliminates a certain amount of the preparatory expenditure. He has adopted the principle of using angle-iron uprights, to which are attached clips and steel shields, which move up as the concrete wall is being constructed. He has been doing some work in the Brighton district, and, from what I have seen of it, it is quite good, but still I think that if bricklayers give a reasonable output, construction in brick will hold its own. In any case, the amount of brickwork in the average cottage represents only about £200, so if we were to save 5 per cent., or even 10 per cent., the amount would not be very considerable.

52. To Mr. Jackson.—We have based our estimates of cost for the whole of the four years' building programme on present rates of wages and prices of material. I do not think there will be much variation during that time.

53. To Mr. Mackay.—In order to improve the appearance of the buildings, and also to make them cooler in hot weather, it may be advisable to coat them with a solution of boiled linseed oil and Portland cement. It would not be a very costly matter. This is the general practice, especially in the coastal districts of northern Queensland and in the north-west of Western Australia, where the sea air causes rapid deterioration of galvanized iron. The wisdom of this course was first brought under my notice many years ago, when I was in Queensland. It is the practice now to treat all tanks with this mixture, and so prolong their life. We have not been troubled very much in Victoria with the effect of sea air upon corrugated iron, but still it would be well to treat the roofs and external galvanized iron walls with the mixture, and so add to the comfort of the men as well as improve the appearance of the buildings. I think, also, that a suitable system of tree planting should be undertaken in order to add to the attractiveness of the place. I am not sure that the airmen would welcome tree planting, but if trees with umbrae foliage were selected, and were planted away from the hangars, they would improve the general appearance of the buildings.

54. To Senator Barnes.—Roof tiles would be more costly than corrugated iron, and, in addition, the roof timbers would have to be considerably strengthened, as the tiles are heavier.

55. To Mr. Mackay.—Only boundary fences are provided for in the building scheme. I presume that divisions between the buildings will be marked by hedges. The doors to the hangars will be on the sliding principle. I am satisfied that they will be comparatively easy to handle. Apart from fire-places in the

dwelling-houses, there will be power points for radiators. The style of construction for the mess-rooms and kitchens has to some extent become standardized. We have similar buildings at Flinders Naval Base, Jervis Bay, and at Duntroon, and I understand they are proving quite satisfactory. The buildings will be removed from Williamstown and re-erected at Laverton for the men's accommodation for about eleven or twelve years old. The material is quite sound. The estimated cost of the nine buildings is £23,980. If by utilizing the material at Williamstown we can save 20 per cent. of that amount—and I think that is quite a reasonable estimate—the saving should be £4,780. I doubt if we could expect to get more than £1,000 for the Williamstown buildings if they were sold. The material could not very well be used for any other purpose. It is probable that the State Government will expect us to remove the buildings without delay, and no doubt we shall shift the whole of it to Laverton at once, although our construction programme will be spread over a period of four years. Probably the whole of the first year's work will be let in one contract. Contractors nowadays are so independent that in many instances we consider ourselves lucky if we get any tenders at all.

56. To Mr. Jackson.—It is possible that, if the work were let separately, a number of small contractors would tender, and in that way perhaps there would be more competition. This aspect of the matter is worthy of consideration.

57. To Mr. Mackay.—A contractor will know from the findings of this Committee what the departmental estimate is, but I do not think that any man would tender without an independent estimate, based on the quantities which are supplied. Frequently contractors tender at a price below the departmental estimate. In the case of the hotel at Canberra our estimate was £44,500, and the contractor who got the job tendered at £43,000, while another man's price was £45,000. We always base our estimates on the latest prices for material and labour.

58. To Mr. Jackson.—If the officers' houses were built of brick instead of timber, the additional cost would be about 12 per cent. Timber has been specified for reasons of economy, but it would be as well, I think, to consider the question of inviting alternative tenders for buildings in brick.

59. To Senator Barnes.—It might be possible to so arrange the first year's building programme as to include all the brickwork in one contract, and all the timber work in another. This would give a master builder, whose chief trade might be that of bricklaying, an opportunity to get one contract, and a master builder, whose chief trade might be that of a carpenter, a chance to get the other. The matter is worth considering.

(Taken at Melbourne.)

THURSDAY, 27TH SEPTEMBER, 1923.

(SECTIONAL COMMITTEE.)

Present:

Mr. Jackson, in the Chair;
Senator Barnes, Mr. Mathews.
Mr. Mackay,

George Francis Hyde, Commodore, Acting First Naval Member of the Naval Board, sworn and examined.

60. To Mr. Jackson.—I am aware of the scheme for establishing an aircraft depot at Laverton. I took no part in deciding upon that scheme, or in the selection of the site. I am completely convinced of the necessity for the early establishment of aeroplane stores, workshops, &c. From a naval point of view, it is absolutely essential that there should be an Air Force to

co-operate with the Sea Forces. The depot proposed to be established at Laverton is essential. Even in the present stage of development of the Air Force, there should be a central depot for the storage of equipment and for the training of personnel. Such a depot should be centrally placed, near a centre of population, and should have railways, roads, telephones, telegraphic, electric light and power, and other facilities available. It should also, if possible, be in the vicinity of the Air Force training centres, and beyond the probable range of submarine attack. It should be in such a position that any materials despatched from it could be readily consigned to either the east or west coasts of the country. As far as we can see, the depot makes provision for naval requirements for the next two or three years. Its position in relation to the sea-coast is regarded as satisfactory.

61. To Mr. Mathews.—I have not seen the site. It has been offered to Point Cook Corio Bay would be used as a training centre for amphibians—seaplanes, torpedo-dropping planes, &c—while Point Cook would be used for training men in the use of land machines, such as fighters, reconnaissance planes, bombing planes, and artillery-observation planes. Port Phillip and Corio Bay are very suitable for training men for seaplanes and torpedo-dropping planes. Torpedoes are expensive weapons, and it is desirable to recover them when they do not run properly. The British Air Force is one of the principal branches of the Service. In the event of an action between two fleets, the fleet possessing the best equipped Air Force stands to win. Two fleets 600 or 700 miles apart can make air contact with each other. An inferior force with superior aircraft could accept action or avoid it. A superior force, with superior aircraft, could bring an inferior force to action. The defence of both Great Britain and Australia depends first upon surface seafarers. Ninety-six per cent. of the defence of Australia depends at present on the British Navy, and 4 per cent. on the Australian Navy. A land force can patrol the sea effectively up to a distance of 100 or 200 miles from the land. I would not say that it can do so with safety, for when compelled to descend in water that was not smooth losses would result. Every fleet in the future must be accompanied by aircraft carriers, which, according to their size, carry up to 60 or 70 flying machines. If Great Britain were to go to war with France to-morrow, French planes, if permitted to do so, could probably destroy London in twenty-four hours. In that case land planes would be used. Australia is not a parallel case, because our distances are so huge. The battle which will decide the fate of this country will probably be fought somewhere east of Singapore, in the Philippines or that direction. The only aircraft that will count in such a battle will come from the fleet. Unless we can get 20,000,000, 30,000,000, or 40,000,000 people in this country, something of the kind is bound to occur, unless it is obviated by the work of the League of Nations. The speed of seaplanes is not equal to that of land-planes. For the same speed they have not the same endurance. They are much heavier in proportion to their power. Fighting planes and reconnaissance planes have a speed up to 150 miles an hour, and some of the very latest, I believe, can travel at 250 miles an hour. The speed of a seaplane is from 70 to 80 miles an hour, and probably not more than 60 miles an hour on long journeys. The speed of a flying boat is about the same as that of a seaplane. The speed is limited by the weight of the machines, the fuel, and the engines.

60. To Mr. Jackson.—I am aware of the scheme for establishing an aircraft depot at Laverton. I took no part in deciding upon that scheme, or in the selection of the site. I am completely convinced of the necessity for the early establishment of aeroplane stores, workshops, &c. From a naval point of view, it is absolutely essential that there should be an Air Force to

submarines. A modern aircraft carrier carries from 60 to 100 planes, which are able to rise from and return to the deck of the ship while it is steaming at from 25 to 30 knots per hour. This is being done every day in European waters. By the terms of the Washington Treaty the tonnage of Great Britain's aircraft carriers is limited to 135,000 tons. Great Britain has not that tonnage at present. An aircraft carrier carries reconnaissance planes, torpedo-dropping planes, bombing planes, and single-seated fighting planes. An amphibian plane is being tried which is supposed to be able to rise either from the land or the water, but up to date it has not been a success. The only aircraft which would be of any account in such battles as we can foresee, which will be fought thousands of miles from the Australian coast, will be aircraft which can operate in conjunction with the naval squadrons. If the command of the sea were completely lost we would have to consider what we could do by way of defence from the land. In the present state of our population, if the command of the sea were lost everything would be lost. If we are to have an Air Force provision must be made for training it. It must have its supply and repair depots. If Australia had an aircraft carrier the personnel for the machines carried by it would have to be trained first over the land. If the men were to use reconnaissance and fighting machines they would be trained at Laverton and Point Cook. Machines and spare parts would have to be provided at a central aircraft depot. After the men had received their initial training at the training depots, they would be further trained in association with the squadron. This is done in connexion with the Atlantic and Mediterranean Fleets. In spite of the shortage of money, great advances in the design of aircraft have been made since the war. This is so in regard to torpedo-dropping planes, to a smaller extent in regard to bombing planes, and to a considerable extent in regard to flying boats. Substantial advances have been made in the type of guns carried by aircraft. At the present moment Japan has ordered a number of planes in England. The available Air Force of Australia is less than an air squadron of one of the Great Powers. Although the depot at Laverton will be suitable for a number of years, if the population of the country increases by many millions it will be necessary to increase the size of the depot and to have similar depots in New South Wales, Queensland, and Western Australia. Communications in Great Britain, which is a small country with a large population, are naturally infinitely better than they are in Australia. I think the landing ground at Laverton is as suitable as the landing grounds in England.

62. *To Senator Barnes.*—Port Phillip represents as good a training centre for the personnel of machines attached to aircraft carriers as can be found. The additional centres proposed are not so much depots as parks—self-contained units, portable hangars, and equipment of personnel and machines. They will not be like a central depot where big repairs can be undertaken. When further development takes place it is conceivable that a similar depot to that proposed at Laverton will have to be provided in New South Wales. From a naval point of view the first requisite is to strengthen the sea-going force. We must have squadrons of bombing and reconnaissance planes to operate off Cape Leeuwin and Gabo Island, where attacks by enemy submarines would be directed against our trade. If the enemy actually obtained the command of the sea by defeating the British Fleet, it would be merely a matter of time before we would be undone. We have a comparatively small population of 5,000,000, and with our trade and commerce at a standstill, no means of manufacturing munitions, no stock of munitions, and no oil or petrol for submarines or aircraft, our position would be beyond hope. In the early stages of a war I do not think there would be any serious danger to this country. There would first

have to be a decisive action between the opposing fleets. The enemy would not be so foolish as to divide its forces in order to attack Australia before it had met the British Fleet. On the other hand, we can always expect that an enemy would send submarines and raiders to Gabo Island and Cape Leeuwin to attack our trade and commerce. Raiders might carry aircraft which would try to create an effect by dropping bombs on our coastal towns. This is the most we could expect in the early stages of a war. When the Singapore base is completed Great Britain will be able to bring its sea forces into action much sooner. There is the further consideration that if the ships have to travel from Europe, when they arrive here their bottoms are dirty, and no docks are available. I therefore regard the Singapore base as a necessity.

63. *To Mr. Mackay.*—An air policy was decided upon several years ago, but it has not been carried out owing to lack of funds. In my opinion the present proposal goes far enough at the moment. The question is one of finance. As we have no aircraft carriers attached to the Australian Fleet, co-operation between the Navy and the Air Force must be confined to what is not purely naval work, such as coast defence and, which is almost the same thing, the patrolling of the focal points of the trade routes off Gabo Island and Cape Leeuwin. The machines which we have in store, I understand, are stored in very unfavorable conditions. If put into service they would be of material value to the military, but would not be of much use to the Navy. Our cruisers do not carry aeroplanes. During the first few weeks of a war the Australian Navy would be avoiding engagements with the superior forces of the enemy. I understand that there are six Fairey seaplanes stored, but I have no knowledge that there are any other naval machines. These are suitable only for port defence purposes. If used for long distance reconnaissance work over the sea they would be in a serious predicament in the event of engine failure. I would not like to say to what extent they are out of date. For the moment the establishment of depots in the States is not urgent, but when money is available something must be done to provide for the more effective defence of Sydney. It is a moot point whether the defence of the principal ports of Australia can be undertaken more effectively by aircraft or fortress artillery. We must have certain guns for combating submarine attacks and to prevent enemy ships coming too close at night. In the day-time aircraft are necessary, and bombing aircraft and torpedo-dropping aircraft must sooner or later form part of the defence of every important coast fortress. As far as one can see, there is no danger of a serious attack upon any of our ports until the main British Fleet has been defeated. I concur with the Air Board's proposal. It meets the needs of the Navy for the time being. It will train personnel in the use of certain machines in anticipation of the time when aircraft carriers will be attached to the naval squadrons. It would be a comparatively small matter to provide a squadron of aircraft near Sydney, or perhaps between Sydney and Newcastle, to defend both places. The training of pilots for seaplanes is different from the training of pilots for land-planes, but a man trained in a fighter or reconnaissance machine would soon learn the work of a pilot at sea. Speaking generally, we should try to retain naval pilots and observers during the greater part of their period of usefulness. There is a proposal for the training of sea pilots in Port Phillip and Corio Bay. I wish the people of Australia realized more than they do their absolute dependence upon the sea. Some people say that all we want is submarines and aircraft. Our overseas trade last year amounted to £240,000,000, and even if we had 10,000 aircraft our trade would be stopped unless we retained command of the sea. Submarines and aircraft depend upon trade, for we have no fuel for them in the country, unless we import it. No one arm is any use without the other.

64. *To Mr. Jackson.*—It is difficult to say what minimum Air Force is required to co-operate with the Navy as constituted at present. It is not strictly correct to say that we have no Navy. Our ships are out of date, and in a war would be called upon to fight ships three times their strength. Aircraft would be essential in assisting us to avoid action with a superior force pending the arrival of the British Force. It is essential that when money can be spared an aircraft carrier should be made available for experimental and other work in Australian waters. It is not essential that an aircraft depot should be on the coast, but it should be on the main lines of communication between the east, west, and north coasts. I do not think it is injudicious to have the depot near a noxious trades area.

65. *To Mr. Mathews.*—At the present moment it is not necessary to have a depot at Darwin; at least, it is certainly not necessary to have a big depot. Darwin is without fortifications, and it might be out of existence a day after the outbreak of war. Fifty efficient aeroplanes would not be an effective defence for Sydney in the event of the enemy securing command of the sea. There would be no necessity for the enemy to take Sydney, because it could land at other places where there are no defences. If it wanted to attack Sydney, the enemy would bring aircraft carriers, and the aircraft would be used to overcome our fifty machines. Having done that, the enemy could bomb Sydney to its heart's content. I do not think that in any conceivable circumstances it can be said that any part of the coast could at all times be defended effectively by aircraft alone. If he has command of the sea, an enemy can choose any point of attack he wishes, and can bring to bear all his available air resources. A nation which has command of the sea can obtain supplies by purchase from neutral and other countries. Submarines and aircraft cannot in any circumstances be considered an effective means of defence. The defence of Australia depends upon the Naval Forces of Great Britain. I regard the establishment of a base at Singapore as indispensable.

66. *To Senator Barnes.*—While the British Fleet is used in an enemy would not take the risk of attacking Australia.

(Taken at Melbourne.)

FRIDAY, 28TH SEPTEMBER, 1923.

(SECTIONAL COMMITTEE.)

Members Present:

Mr. JACKSON, in the Chair;
Senator Barnes, | Mr. Mathews.
Mr. Mackay,

Captain Ernest James Jones, M.C., D.F.C., Superintendent Flying Operations, Civil Aviation Branch, Department of Defence, Melbourne, sworn and examined.

67. *To Mr. Jackson.*—I was associated with the Royal Australian Air Force for about twelve months from the beginning of 1920, but I am not now connected with that Force. I understand the Committee is inquiring into the construction of aircraft workshops, stores, &c., at Laverton, and although I have some idea of what is intended I am not very familiar with the proposal. A depot at Laverton would not be very serviceable for handling seaplanes, as one would naturally expect that a naval aircraft depot should be near the sea. In the event of war it is possible that a number of pilots engaged in civil aviation could be drafted into units and render service in the Air Force after they had undergone some additional training. The Civil Aviation Branch does not control civil aviation further than to see that the Air Navigation Regulations are

complied with. The aeroplanes in use for civil aviation are the property of the contractors, under whose direct control they operate. The provision of stores and arrangements for repairs to these machines are matters for the contractors, who arrange all details in connexion with their services, and also the maintenance and repair of equipment. The time-tables have to be approved by the Minister for Defence and the Postmaster-General. It is not the policy of the Government to interfere too much with the operations of these contractors. If that were done I think it would rather tend to detract from the efficiency of the service rendered. Tenders are called for in connexion with subsidized services and the person who submits a tender, which is eventually accepted, is regarded as the contractor. I have been in touch with aviation for some years, and know that it is necessary to provide workshops and stores on a fairly extensive scale. In connexion with the service between Geraldton and Derby, in Western Australia, a certain amount of repair work can be undertaken at points between two recognised stopping places in the event of a forced landing. In some cases of minor accidents between stopping places, arrangements can be made to send necessary spare parts by air or by motor car. In the event of a crash, and it being impossible to repair the damage on the spot, the machine would be returned to the depot at Perth. Under certain conditions it might be returned to the nearest stopping place, where repair would be effected at a route depot. In connexion with the Geraldton to Derby service, the main workshop is situated in Perth, in which city there are, also, many facilities provided by private companies which can be availed of. It would be very expensive for the company to erect a plant capable of undertaking all branches of constructional and repair work, and in Western Australia it pays the contractors to avail themselves of the facilities which already exist. In some cases heavy machinery is required and also woodworking tools, which cost a good deal.

68. *To Mr. Mackay.*—I understand that a part of the programme of the Air Force includes the formation of a Citizen Air Force. My principal duties in connexion with the branch include the examination of pilots who apply for licences, and I also represent Colonel Brinsmead when he is absent. I have not seen any correspondence from the Brisbane Aero Club concerning the request of a "gift" engine for instructional purposes, but I have seen correspondence from technical colleges and Universities. I do not know if any of the gift machines or engines have been handed over to these clubs or technical colleges for instructional purposes. Certain Universities and technical colleges have procured engines suitable for instructional purposes through the British Air Ministry, or the Aircraft Disposals Board, which has a large number of engines on hand. Any applications made for the use of engines for this purpose do not come through me, but through another officer. I believe that in certain cases we arranged for payment on behalf of a University, and also for the despatch of the engine from London and the delivery on its arrival here. I understand that there are a number of engines at Point Cook and Spotswood which are not required for immediate use, but which are necessary for equipping squadrons, the formation of which the authorities have in view. The letting of contracts in connexion with mail services is arranged in the Civil Aviation Branch. The service between Geraldton and Derby over a distance of 1,195 miles is being conducted by Western Australian Airways Limited. A contract has been let to the Queensland and Northern Territory Aerial Service Limited, of Longreach, for a service which is being conducted between Charleville and Cloncurry. Contracts have been arranged for a service between Sydney and Adelaide, and Sydney and Brisbane, with the Larkin Aircraft Supply Company Limited. The first two services have been in operation for some time, and it is hoped that the others will be

commenced within a few months. A return is sent in after each trip, showing generally the conditions encountered, as well as the times of departure and arrival of machines. The information contained in these reports is communicated to the Air Board, and is used chiefly for checking purposes; it is not of much use for Defence purposes. It is somewhat difficult to collate meteorological observations made from aircraft. A pilot may make general observations and obtain records at different altitudes, but no definite observations are made of temperature, humidity, and density. I cannot say whether the Air Force has made any effort to keep in touch with the men who acted as or received training as pilots during the war. The policy of the Department is to encourage civil aviation, and contracts are arranged for certain services. Our branch is a very small one, and consists of four officers, three assistants, and four or five clerks. Aircraft operating over the established mail routes carry only the mail matter on which a surcharge has been paid, the balance going in the ordinary way. Apart from mail services, a considerable amount of assistance is given by our Department to civil aviation. There are small private companies, some of which are doing a certain amount of constructional work, some of their staff are engaged in actual flying. A considerable amount of expenditure has been incurred in preparing landing grounds for general use, and any person flying a machine, if he possesses the necessary licence and his machine is also licensed, may use these grounds. Landing grounds have been acquired in all the capital cities in Australia with the exception of Perth, apart from those on the subsidized routes. The landing grounds on the subsidized routes are used more or less frequently by machines other than those engaged on established services. Expenditure is incurred in the maintenance of these grounds, but I do not think it is very considerable.

60. *To Senator Barnes.*—I did not suggest that the Laverton site was unsuitable as an aircraft dépôt for general purposes, but only as regards the operation and testing of seaplanes. I understand the dépôt at Laverton is to be used for accommodating seaplanes as well as landplanes. A site on the sea-coast would be preferable as a dépôt for seaplanes. I have not been to Spotswood, and, therefore, cannot say definitely what machines are stored there. The depreciation that would occur would depend on the method of storage and the work done on the machines during the period in which they were in store. Generally speaking, I think the material would deteriorate, although, perhaps, only to a minor extent. Wood-work particularly is liable to deterioration under almost any conditions, and even if the storage accommodation provided was in every way satisfactory, and the staff sufficiently large to give the equipment all the attention that was necessary, there is bound to be depreciation. I did not suggest that if the contractors were interfered with, efficiency in the mail services would be seriously impaired, but that it was not advisable for the Government to interfere too much in the operations of the contractors. They should be allowed to carry on their work in the way they consider best, provided they comply with the conditions set down and observe the timetable agreed upon. It is the duty of our Department to see that they adhere to the conditions under which they have agreed to operate. If the equipment stored at Spotswood were to be utilized for civil aviation purposes the machines would have to be modified to a certain extent before they would be suitable for use except for emergency purposes. The machines at Spotswood are not designed to carry passengers except such members of the crew as are necessary for the particular work the machine is designed to do. A week or two ago an Air Force machine was despatched to Swan Hill, and carried as passengers the Commissioner of Police and Dr. Syme. Although the machine used could, with certain

modifications, carry four people, it required a considerable time before the two passengers could be comfortably accommodated in it. The alterations necessary to make those machines suitable for civil purposes would occupy a good deal of time, and the expenditure would be fairly heavy. An effort is being made to co-ordinate the work of the two branches, and the Civil Aviation Department receives a good deal of assistance from the Air Force. We have carried out a number of surveys for aerial routes through the Department of Works and Railways, as well as the work associated with the construction and maintenance of aerodromes, but we do not do it all. Certain routes are prepared purely from a defence point of view, and that work is undertaken by the Royal Australian Air Force. The routes which the Air Force prepare can be used by machine engaged in civil aviation. The proposed dépôt at Laverton does not directly concern the Civil Aviation Branch excepting in so far as the establishment of such a dépôt is necessary before any expansion of the Air Force can take place, in which case we might expect further assistance from the Air Force. It is difficult to say to what extent the expenditure involved in connexion with air defence could be of service for civil purposes, because the work of the Air Force is different from that of a civil aviation company in numerous respects. The pilots engaged in the Air Force, for instance, have to be trained in various subjects which would be of no use to a civil pilot, such as aerial gunnery, artillery observation, aerial photography and wireless. It has been suggested that in the event of war artisans engaged in various trades are mustered for war work, but many of these men are employed in doing the work on which they were engaged in civil life. A civil aviation pilot could not be expected to range a battery of artillery on a pre-arranged target without considerable training. Civil aviation pilots employed on subsidized services would be members of the Air Force Reserve.

70. *To Mr. Mathews.*—Although it is true that the Government are subsidizing civil aviation because they feel that it would be of service in the event of war, that is a matter for the Royal Australian Air Force, which, I understand, has in view the formation of a Reserve. These men, however, cannot be trained until a unit has been formed. The Civil Aviation Branch of the Defence Department is associated with Laverton and Point Cook only in a very indirect way. The Controller of Civil Aviation is a member of the Air Council, and proposals such as the establishment of a dépôt at Laverton are discussed by the Air Council. Machines operating on subsidized routes or for private companies are not repaired at Point Cook. So far as I know, no request has been made for repairs to be effected there. Probably about 25 or 30 small companies, owning perhaps one or two machines each, are operating. They are not under our control, but have to comply with the Air Navigation Regulations. The machines have to be registered, licensed, and certified periodically as being air-worthy by ground engineers licensed by the Department. Apart from the machines I have mentioned, there are about 60 or 70 machines in Australia, all of which are registered. A very small number has been purchased from the Defence Department, and they were all machines which were regarded as surplus stock. There are only five or six machines in Australia used solely for sporting purposes. The machines on the subsidized routes carry quite an appreciable number of passengers. There have been very few accidents during the last two years. There is very little likelihood of the subsidized services being self-supporting for a number of years. The Western Australian Airways Limited, which is conducting the service between Geraldton and Derby, receives a subsidy of £25,000 a year from the Government. The company is operating with six machines, and the staff consists of about twenty men. Each machine has to allow space for the carriage of 100 lbs. in weight of mail matter, the cost of the carriage of which is covered by the subsidy. With the assistance that is given, I believe the services

are paying. A service could be conducted between Port Augusta and Port Darwin by the Royal Australian Air Force; but it would interfere rather too much with the proper training of the personnel, and such a service would be much more expensive for providing assistance to those in the more remote parts between those two points than if conducted by some civil organization. The Western Australian Airways Limited, in Perth, have workshops in which they do their own repairs, and where work for others is also undertaken. There are also firms in Melbourne and Geelong which undertake repair work, but which are not engaged in manufacturing. A contractor has to insure his pilots, and the only financial assistance he receives is in the form of a subsidy.

71. *To Mr. Jackson.*—The Air Force prepared a number of landing grounds on the Geraldton to Derby route, but that work was commenced almost immediately after the Civil Aviation Branch was formed. The Charleville to Cloncurry and the other routes were prepared by the Civil Aviation Branch.

Captain Herbert Joseph Larkin, Managing Director, Larkin Aircraft Supply Company Limited, Melbourne, sworn and examined.

72. *To Mr. Jackson.*—The company which I represent has several machines operating in Melbourne, but up to the present we have not been working over any particular route. I have had considerable experience in aviation since 1916. I have perused the plans of the proposed Aircraft Dépôt at Laverton, which appears to be fairly complete, although, I understand, no provision has been made for travelling workshops. It is part of a squadron equipment to have transport lorries fitted with lathes and drills, but no provision in this direction appears to have been made. I have not been into the question of the space required for stores, but I understand that that phase has been carefully considered by the responsible officers. The first need should be the provision of adequate shelter for the large quantity of "gift" material received from the Imperial authorities, and it would appear from the plans that satisfactory arrangements have been made in this direction. All the "gift" material will require considerable overhaul before it is serviceable, and I understand that the repair dépôt will not be available until the second year, which would suggest that the material now stored will not be of very much use in the meantime. The workshops at Point Cook will be supplemented; but the provision to be made for the "gift" material will not be quite adequate if it should be required at short notice. If the authorities are satisfied that it can be held over for the time being the present workshops should meet requirements. I understand the proposal is to construct the dépôt in sections in four yearly periods, and if that is so it means that until the whole of the programme is complete Australia's air defence will be of comparatively little value. At present it is practically negligible. Until the workshops and dépôts are completed in the second year and the machines overhauled and rendered fit for service, we cannot expect any material increase in the strength of the Air Force I have seen the Point Cook equipment, and I do not approve of the method under which many of the machines and stores are housed at present. Those under canvas hangars are suffering deterioration, as also are the stores under canvas. The company which I represent has its own workshops at Essendon, and we employ between twenty and thirty mechanics. When dealing with a small number we require the services of two mechanics per machine up to six, but when we increase beyond that number it means three mechanics to two machines. From a flying point of view, I think the site at Laverton is suitable, as the surrounding country is excellent. After the termination of the war I inspected some of the aircraft depôts in Great Britain, many of which are not only as comprehensive as that proposed, but are also far superior. As to whether the workshops at Point Cook are sufficiently up-to-date, much depends

on the class of work to be undertaken. For ordinary running repairs for service equipment they may be regarded as satisfactory, but as the head quarters of a Royal Air Force, considering the matter from a war point of view, there is much to be desired.

73. *To Mr. Mathews.*—My company has not yet received a subsidy from the Government, but when the service for which our tender was accepted is established we will receive Government assistance. I understand it is the intention to form a Royal Air Force Reserve, and when that is done I believe a number of those engaged in civil aviation will join the Reserve. It is compulsory for contractors under the Government to join the Reserve, but nothing has been done in that direction, as the Reserve Force has not yet been formed. Personally, I would be willing to join, and I think it is the duty of those eligible also to join. We have not given consideration to the possibility of establishing a service between Port Augusta and Port Darwin. Such a service could not possibly pay on account of the long distance over which fuel would have to be carried to the detriment of the paying load, and also on account of the sparsity of population. If it were the policy of the Government to endeavour to open up the country between those two points by means of an air service providing facilities to the residents, such a service would have to be subsidized for many years. A larger subsidy than is paid in connexion with the service between Geraldton and Derby would be necessary, because supplies would have to be transported by camel, which is a costly means of transport. In Western Australia fuel and other supplies can be carried to certain points by water. Supplies would have to be carried from Oodnadatta to Alice Springs by camel, and dépôts would be required about every 500 mls. Aircraft could not economically carry stores, because it would interfere with the paying load by utilizing the available space Mails and passengers could be carried, but a heavy subsidy would be necessary. Perhaps one trip a fortnight, or every three weeks, could be made as far as Alice Springs, in which case the subsidy would not be as great as on the Western Australian route, where there is a weekly service. My company has not been approached by the Government in this connexion, although I understand that the Rev. Flynn has some such project in mind. Apart from engines, there is nothing to prevent aircraft being manufactured in Australia. Engines are not likely to be profitably manufactured here, because there is little hope of their being produced in sufficient quantities to render the price acceptable, as is the case in other parts of the world. The designing and overhead costs would have to be carried by a comparatively small number of engines. I do not know of any instance in which a standard type of engine has proved a success. In the United States of America an effort was made to standardize the "Liberty" engine, but it was not attended with very successful results. The American people were then without any other suitable type. In Great Britain competitive designs were sought, and the result has been that several first class engines are available. An engine that might suit my company might not, for instance, suit the Western Australian company. Different pilots have different opinions of engines and it would not pay to manufacture a standard type. The best alternative would be to obtain from Great Britain designs of leading engines and manufacture them here under a royalty instead of attempting to design a type of our own. Even if we imported the patterns and jigs it would not be cheaper than importing a complete engine. Considering the question from the aspect of encouraging our own industries it would be advisable, but the engines would be very costly. From the defence point of view such an investment might be regarded as highly satisfactory. Our flying men can be insured in most companies without the payment of an extra premium, but there is great difficulty in making similar provision in regard to the machines owing to the limited number. I know the managing-director of the company operating in

Western Australia, and am conversant with only a few details of the service. That company is receiving a subsidy from the Government of £25,000 a year, and I do not think it will be able to conduct the service without a subsidy for at least the next ten years, although that view is not held by others. It has been suggested that with the extension of our railway system, the need for aerial services will not be pressing. I believe that aircraft will establish lines of business independent of railways and sea carriage, and that aeroplanes will be to the railways what a telegraph service is to a letter service. An aerial service will provide for the urgent transport of material, but will not take from the railways the carriage of heavy bulk material, the delivery of which is not pressing. As to the routes over which aerial services could be successfully conducted, I have always advocated a service between Brisbane and Adelaide, which traverses the most thickly populated rural portions of Australia, and should, from the point of view of becoming self-supporting, relieve the Government of the necessity of paying subsidies. There are wealthy districts along the Murray River, and in the north-western portions of New South Wales, such as the Riverina and north coast river country. Landing places have been arranged between Brisbane and Adelaide, and the service, when established, will be once a week each way. When the service has been in operation six months, an aeroplane would leave Adelaide say at breakfast time to-day and reach Brisbane by 4.30 p.m. to-morrow. There would be no travelling at night.

74 *To Senator Barnes.*—I have had three years' military and four years' civil experience. I have some knowledge of the equipment stored at Spotswood. The engines there would be suitable for our requirements, but not the machines. I was in charge of equipment for different periods during the war, and I have a knowledge of the deterioration which occurs when equipment is stored for a time. There would be deterioration of the equipment at Spotswood even if it were stored under the most satisfactory conditions. We have recently landed an engine which had been very properly packed and stored in Great Britain and when it was opened up we found that it was badly rusted. The condensation of the atmosphere cannot be kept off the metal and rust naturally follows. Unless the cases were opened up every six months and the contents thoroughly overhauled, the cost of which would be excessive, the equipment cannot be prevented from deteriorating. Many of the machines at Spotswood must be in a bad state, and, in fact, to-day I believe they are obsolete. For training and auxiliary purposes they may be satisfactory, but for use in the event of war they would not last twenty-four hours against those in the possession of a well-equipped enemy. I do not think the defence and civil branches could co-ordinate in times of peace. A civil pilot has to possess knowledge concerning the handling of cargo, passengers, and mails, and the preparation of returns, which would be of little use to him in time of war, whereas the knowledge which has to be acquired by a defence pilot would be of little use for civil purposes. A defence pilot could not carry on the work of a civil officer and at the same time acquire the training which would be necessary for war service.

75 *To Mr. Jackson.*—I do not think the present system of subsidizing an aerial service is sufficient to encourage civil aviation. For instance, my company received a contract nearly two years ago for the carriage of mails, but up to the present we have not been able to get the service going and earn the subsidy, consequently we have been operating at great loss through no fault of our own. It is very difficult to obtain delivery of efficient aircraft to carry out an aerial service. We have to keep our staff together, and the

maintenance of our workshops involves the expenditure of a lot of money. In our particular case, by the time the first year's subsidy is received it will be more than absorbed by the losses which we have already incurred during the time that we have been waiting. I am of the opinion that the provision of an aircraft depot is an absolute necessity, and that we should have such depots in the different States. As the proposed buildings are to be of a permanent nature, I am not in favour of a portion of the structures being built of wood, but, of course, the question of expense has to be considered. So far as possible they should be constructed of fire-resistant material.

76 *To Mr. Mackay.*—I am not at all satisfied with the work of the Civil Aviation Branch, and we regret very much having gone into the business, because we have shown a loss during the last four years. Immediately after the termination of the war we formed a civil aviation company to operate aeroplanes in Australia on a commercial basis. On arrival in Australia, I found that no provision had been made for framing regulations for the control of such services, and the Government were approached with a view to forming a definite policy. From time to time the matter was mentioned in the House and eventually a Civil Aviation Branch was established. The Treasurer, in submitting the Estimates in 1920, said that services would be inaugurated and the Government would not hesitate to provide substantial bonuses for the manufacture of aircraft in Australia. After the Civil Aviation Department was established, it was twelve months before we received a contract to conduct an aerial service—that was in November, 1921. It is now September, 1923, and we have been unable to start the service owing to the difficulty in obtaining machines from Great Britain. We have not received a subsidy of any description from the Government, and although we have made numerous applications to commence a section of the service with the machines already available in Australia, that permission has been refused by the Controller of Civil Aviation. We have also endeavoured, without success, to obtain some idea of the future policy of the Government in connexion with the construction of aircraft, and as a result, thousands of pounds of our shareholders' money have been lost. We were induced to support civil aviation from patriotic motives backed by the promise of the Government to support us. We appreciate that the conditions of our contract have not been carried out by our company, but at the same time these conditions have proved to be so difficult that it would be impossible for any company to closely observe them. Our greatest obstacle is in obtaining suitable aircraft from Great Britain, and we are still waiting for the machines to be shipped. We understand that they have been in the hands of the British Air Ministry for four months undergoing trials. They are of the latest possible type. If we had been content to tender for the use of cheaper machines, we would be operating as other companies are, and reaping the award of the Government subsidy, but we were ambitious and anxious to use the most efficient and up-to-date aeroplanes. As we have failed to secure delivery in the promised time, we have sacrificed a considerable portion of the income which would have been received. At the end of the first year's operations it will be impossible for us to show a profit owing to the losses already incurred. We are merely asking for similar concessions as those which have been extended to other companies, by being allowed to conduct a section of the service. The machines we have are far superior to any others in Australia, and we cannot understand the Department refusing to allow us to commence. Our machines are post-war models, and the same cannot be said of machines employed on other services. The Western Australian service was commenced before our contract was accepted, and the

Queensland service was commenced afterwards. The latter mentioned has been operating for nine months and drawing a subsidy at the rate of £12,000 a year. The Queensland company is using pre-war machines. The statement has been made that the Controller of Civil Aviation does not consider that we have sufficient stores and spare parts to carry out the work, but it has already been pointed out that our supplies are quite adequate and that we are carrying more than the Queensland company. We have even been asked to supply the Queensland company with stores, and we received a telegraphic request only yesterday for a propeller. We have spent many thousands of pounds on spares and stores, and should be placed on the same basis as the other companies. The Queensland company started its service by purchasing machines which had been used for carrying "joy" riders, but as we wanted only first-class machines, we stipulated in our contract that those manufactured to our own design would be supplied. The complaint we have against the Department is that it might have been more generous and treated us the same as other companies have been treated. I have always been a strong critic of the Civil Aviation Department, and have at times publicly directed attention to what I considered faults in its policy, and for that reason my company has not been treated with the same consideration as others. Strenuous efforts have been made to secure reasonable consideration but without success. A sum of £50,000 has been subscribed—as much as has been paid into the other two companies— included in which is £12,000 from Mr. Howard Smith, and a similar amount from Mr. Leslie McPherson. These gentlemen and other shareholders are of the opinion that sooner or later satisfaction will be obtained, but the Controller of Civil Aviation appears to view our position from a different stand-point from what we do. I am almost ashamed to meet our shareholders. The members of the Committee are probably aware that a Vickers-Vimy which was supplied to the Queensland company proved unsuitable under Australian conditions, and if that company had been waiting for two machines of that type, it would not have started operations yet. The company, however, was told that it could go ahead with the machines it had. The Department has refused to let us proceed unless we can supply the machines stipulated in the contract. Three months ago the British Air Ministry said our machines would be ready in a week or two, but they have not yet been shipped, and we are entirely in their hands. We intend to employ six machines in the service, three of which we have here, as well as others. We wanted to commence a section of the service with three machines but permission was refused. I believe the departmental officers believe that we have been unfairly treated.

77 *To Senator Barnes.*—I consider the storage depots in Great Britain suitable to that proposed at Laverton, because the hangars are very airy. The height of the walls in the proposed structure is 18 feet, whereas in Great Britain 22 feet is the usual height. In Great Britain the general type of construction is superior, as there are concrete hangars in many places, and the offices are situated on the side of the hangar and are of a more permanent nature. They have also a semi-circular roof covering of malthoid or some similar material, but at Laverton the roofs are to be of galvanized iron. It will be impossible to preserve the wood and fabric in good order under an iron roofing in the summer time.

78 *To Mr. Jackson.*—If the roof is to be of iron a ceiling should be provided in order to reduce the temperature. I notice also that a number of doors are to be provided in the garage, and it would appear that a large door at each end would be sufficient unless the building is to be divided into compartments. There may be a good reason for having a number of doors, but the provision of such is always an expensive item.

(*Taken at Melbourne.*)

SATURDAY, 29th SEPTEMBER, 1923.
(SECTIONAL COMMITTEE.)

Members Present:

Mr. JACKSON, in the Chair;

Senator Barnes,

Mr. Mathews.

Mr. Mackay,

Major Harry Turner Shaw, Aerial Engineer, owner of the Shaw Aviation Company, sworn and examined.

79 *To Mr. Jackson.*—I have three aeroplanes, and I employ a staff of about six men. I am not engaged in Government mail contracts, but I am doing passenger and photographic work. I have had considerable experience in aerial navigation, including war service. The proposed premises at Laverton are suitable for an aircraft depot, both for Military and Naval Forces. I think the site is as good as any other. The proposed buildings should meet the requirements of the Department for the time being. From experience in the storage of aircraft, I have found that if the machines are properly stored they will remain in good condition for a very considerable period. They need to be protected from excessive heat and from dampness. They should be dismantled, and the wings should be stored in such a way that they will not have a chance to warp. It is merely a matter of packing. I have one engine present, an engine that has been stored for a couple of years, and it is quite fit for use without overhauling. To my mind the buildings proposed at Laverton are required immediately, but there are certain matters upon which I am not informed, the matter of money for instance, and the question whether this country is to be defended or not. If there is to be proper air defence, the Laverton proposal may be regarded as simply the nucleus of a very necessary provision.

80 *To Mr. Mackay.*—Certainly the proposal represents an important step forward. Aircraft must deteriorate if left as they are at Point Cook. If one of the hangars broke loose the machines would be smashed up. My relations with the Civil Aviation Branch have been most cordial. I understand the Department's difficulties, and I do not expect too much, but I have always found the officials sympathetic. Our pilots have the usual licences and they are subject to the usual medical examination, which I regard as decidedly necessary. I know the Spotswood depot, but I have not actually seen the stores there. Some of the machines may be serviceable without overhaul, while others may require extensive overhaul. If a case has been damaged by sea-water, the contents may be in a very bad condition; in other instances the engines may be perfect. A few of them are usable and are too good to scrap, but they are not up-to-date. Military aviation is receiving most attention at present. Commercial aviation is a comparatively small matter so far. Most progress has been made in America.

81 *To Senator Barnes.*—If I were in charge of the machines stored at Spotswood, knowing that the erection of the Laverton buildings would occupy a period of three years, I would, as a businessman, prefer to make some use of them rather than allow them to lie idle. The engines could not be disposed of to advantage because there is no market for them. They are practically worth their scrap weight. They are not suitable for a motor car or a motor boat. They are certainly obsolete, and are deteriorating all the time. If all those machines were either scrapped or burnt it would seem a great waste, but it would really be a good thing for aviation, because we should then have to obtain up-to-date engines, and it would probably mean the starting of the aircraft industry in Australia. I would suggest using up those engines. Until we have aircraft manufactured

here and until we secure up-to-date machines, our Air Force is not worthy of the country. It would be a costly process to use these idle machines, but a few could be employed civilly. Some of them could be put on the mail runs. I have experienced no difficulty in obtaining the machines necessary for my business. I am limited only by the cost of the aeroplanes, because they are very expensive. It would be possible for the Air Defence Force to work in conjunction with civil aviation, although it would be rather unprecedented. Private firms operating subsidized mail routes could supply more trained men at a lower cost than that of working routes purely under Government supervision. Men in private employment are better trained and work harder than those in Government employ. It would be very expensive to maintain an Air Force sufficiently powerful to defend this country, but with a good civil backing the Air Force could be quickly strengthened to meet war requirements, just as the British Navy and Army were at the outbreak of the last war.

82. *To Mr. Mathews.*—I have done some repair work. The number of men I am able to employ is limited by the quantity of work I can get. It would not be economical to manufacture aeroplane engines in Australia yet, but I have no doubt that it could be done. It would be difficult to fix a standard engine because the conditions in Australia vary greatly. Although it might be possible to have a standard for civil aviation, for military work at least three standards would be needed. I have no doubt that all the men trained in air work would be available for service in time of trouble. I am not in receipt of any Government subsidy at present. There is difficulty in securing first class mechanics for aeroplane repair work. The Military Forces do not attract the best men, because the pay offered by private employers is high. Even if the pay were equal I do not think that the best mechanic would join the Air Defence Force. This is not due to the military discipline; it is because the best workman always likes to be independent, and I am afraid you will never have any first class men in the Defence Force in peace time. You are more inclined to attract the lesser. Aerial defence will not be as expensive as it would be to replace it with another arm. Aeroplanes are quite practicable for scouting purposes a few hundred miles out from the coasts of Australia. It would be a reasonable war risk to send a seaplane on such a mission. The monetary loss of a destroyer and crew would be considerably greater than the loss of a whole squadron of aeroplanes.

83. *To Mr. Mackay.*—The windy weather experienced at Laverton would probably result in the production of better trained men than would be obtained in, say, the Riverina.

84. *To Mr. Jackson.*—You tell me that an engine stored in England for six months was said to be very badly rusted. The atmospheric conditions in England are considerably damper than in Victoria, and it is quite possible that if an engine were stored on a damp dry, or had been left in a damp place, a certain amount of moisture would collect in it. I do not know that I should recommend constructing the buildings at Laverton wholly of brick, even if the cost were not very much greater. Theoretically, wood should burn more easily than a brick building, but once a fire takes charge of premises, it does not seem to make much difference whether it is fireproof or not—it goes just the same. I am convinced of the necessity of the proposed depot, and I regard it as only one of a number that will be eventually required in Australia. I feel that we have not yet finished with war. Just how much time there is for us to "play around" is mere guesswork. The manufacture of aircraft in Australia I regard as essential. In the last war, motor transport was the backbone of the forces, and that transport was drawn from civil life. Just as the Navy drew its men largely from the mercantile marine, so also, 50 or 75 per cent. of the

men needed for air defence must come from civil aviation. I feel sure that Australia could turn out a satisfactory engine for aeroplane work, but I should suggest importing a number for a year or two,

(Taken at Melbourne.)

MONDAY, 1st OCTOBER, 1923.

Present:

Mr. JACKSON, in the Chair;

Senator Barnes. | Mr. Mathews.

Albert Charles Joyce, Finance Member of the Air Board, sworn and examined.

85. *To Mr. Jackson.*—I am acquainted with the general outline with the proposal before the Committee. I had no personal part in the preparation of the plans. The proposal and plans were submitted by the First Air Member and placed before the Air Board as a whole. The Board considered the proposal, and submitted its recommendation to the Air Council, which in turn passed it on to the Minister. The Air Board is the administrative body which administers the Air Force. Certain matters of policy have to be submitted to the Air Council, which is a joint body representative of the Navy, the Military, and the Air Force. The present scheme is in main outline the same as that recommended by the Air Council, but there have been some minor alterations in details as the result of a conference with officers of the Works and Railways Department. In connexion with the Air Force the responsibility for finance rests entirely upon me. The original estimates for this work came before me to be scrutinized and criticised. Once a proposal such as this is approved by the Minister and submitted to the Works and Railways Department, a Finance Member of the Air Board, I have nothing more to do with it. Subject to amounts being placed on the Estimates the control is really exercised by the Works and Railways Department. The Estimates have to come before the Air Board in the first place. It is the Air Board that recommends that the vote should be placed on the Estimates. The Air Council, as a rule, does not originate proposals. The Air Board considers that the Laverton scheme is necessary. We considered the vote recommended the lowest sum that would be required covering a period of four years to provide for efficiency in respect of the Air Force, for at least one portion of Australia. I know the site selected at Laverton for the Aircraft Depot. It was recommended by the Air Board. So far as I know no other sites were even suggested for the depot, other than Point Cook. Consideration was given to the question whether the depot should be established at Point Cook, but mainly for financial and transport reasons, the Laverton site was recommended. The Air Board has had considerable difficulty in convincing the authorities of the necessity to provide more money for the Air Force. The Board made representations concerning what was considered necessary to proceed with its programme, but it has been impossible to carry out the programme owing to the lack of funds. During the last two years the Air Board has been restricted in the amounts allotted to it. In each of those years the Board has been allotted for all purposes a fixed sum of £250,000 for the whole year. That very largely accounts for the fact that many thousands of pounds' worth of materials and stores have been kept under hangars covered with canvas. But even if ample funds had been available during the last two years, I question very much whether the depot would have been proceeded with owing to the formalities through which the scheme has to go. Had funds been available no doubt better arrangements might have been made for the storage of supplies and machines. There is no question that better storage should be provided without delay.

85A. *To Mr. Mathews.*—Before the Air Board decided to recommend the site at Laverton for the depot the question of its establishment at Point Cook was considered in great detail. The main consideration was, of course, the question of transport facilities. I do not know whether they hold good now, but, on the figures submitted at the time, which were based on costs at the time of the establishment of the depot at Point Cook, instead of at Laverton, would have involved an additional expenditure of roughly £200,000, mainly owing to the necessity of building a railway from Laverton to Point Cook. As the Laverton site was alongside the railway line and certain concessions were offered by the State Railway Department, the establishment of the depot at that site was undoubtedly the better proposition. This is so although it involves the separation of two branches of the Air Force, because the depot was intended to serve not only Point Cook, but units established at other places. At the time it was proposed to establish another unit at Corio, where a site had actually been purchased for the purpose. According to the Air Board's programme this depot was required to supply both Point Cook and the site at Corio. The depot would not be of very much use to the Air Force in other States. In days to come it will almost certainly be necessary to establish another depot in New South Wales to supply units established there. Speaking generally, the Laverton depot will be useful only for Victoria. Freight charges are such that it could be used only in a minor degree for the other States. To use the Laverton depot as a bulk store for the other States would be a costly proposition. The Laverton site was recommended in the first place by the First Air Member, Wing Commander Williams, who is now in England. He is an officer of great experience. It was his duty to recommend a site. The Air Board consists of three members, only two of whom have had flying experience. I am the civil member of the Board. The Board has full control of Point Cook. Pending the building of the Aircraft Depot we can make only temporary arrangements at Point Cook. Permanent buildings can be erected there only to meet permanent requirements. When the Aircraft Depot is established it is intended that Point Cook shall be used only as a training school. The stores kept in the hangars have deteriorated to some extent. There has been a certain amount of leakage of oil which would have been avoided if it had been properly housed. The containers are good, but the percentage of loss would certainly be less if buildings were constructed in which the oil could be properly stored. I should point out that there is a great deal more oil stored at present than would be stored in ordinary circumstances, owing to the fact that a large quantity of oil was included amongst the gift stores presented by the British Government. The total expenditure by the Board in the last financial year amounted to £183,517. This covered the ordinary services, pay of personnel, contingencies, and new works expenditure. The amount voted was £250,000, so that over £60,000 of the vote lapsed. The great bulk of the amount that lapsed covered the provision made for expenditure by the Works and Railways Department as portion of the first year's expenditure on the Aircraft Depot at Laverton and for other building purposes. This proposal has been before the authorities now for three years. In each year the provision made for the Aircraft Depot has lapsed because the proposal has not been finally approved. The Aircraft Depot is designed to provide adequate protection for material and stores, and pending going on with that proposal only temporary arrangements can be made for their storage. The equipment is at present stored in temporary canvas-covered hangars which have been reported on from time to time as being unsatisfactory. The Board is not satisfied with the progress made with this proposal. It has been very anxious during the past two years that the work should be gone on with. It is not due to any laxity on the part of the Air Board that the proposal has not been proceeded with. If it could possibly be

done the Board would recommend that the whole of the money required to complete the proposal should be expended in two years rather than in four years. In proposing a programme for four years the Board had to take into consideration, in the first place, the amount of money likely to be provided, and in the second place, the rate at which the Works and Railways Department could proceed with the work. Past experience has shown that only a limited amount of work can be done in one year. Final consideration of the advisability of manufacturing complete aeroplanes in Australia would not come within the powers of the Air Board, though it would be quite competent for the Board to make the suggestion. The question of local manufacture has been considered by the Board, and, some twelve months ago, it submitted its comments on the matter to the Minister. It had been proposed to establish a Government aircraft factory, but the Ministry at the time did not concur in the proposal, and it was allowed to lapse. The proposal did not emanate from the Air Board, but from the Munitions Supply Board. A comprehensive scheme was not drawn up, a proposal in general outline only was submitted. Speaking from memory, I think that the proposal did not include the manufacture of engines at that stage, but merely the manufacture of aircraft. The manufacture of engines is a much bigger proposition. It will be some years before we are in a position to do anything in that direction. Some years ago two aircraft engines were manufactured by local firms in Victoria. I believe they are at present in the War Museum. I do not think they were tried out. I could not say whether experts passed any opinion on their probable efficiency. I have seen only reports on them. The position at present is uncertain, and it seems premature at this stage to make a proposal for the manufacture of aircraft engines in Australia. It is a technical question which I am not competent to answer, but I think a previous witness before the Committee, was a little wide of the mark in expressing the opinion that the Air Force was useless without provision for the manufacture of aircraft engines here. Of course, if we were absolutely cut off from supplies from overseas the efficiency of the Air Force would depend on the time the existing plant would last. It would be very desirable for Australia to be self-contained in this matter, and if we could manufacture aircraft engines so much the better.

86. *To Senator Barnes.*—When it was estimated that it would cost £60,000 more to establish the depot at Point Cook than at Laverton the fact that its establishment at Laverton would involve considerable cost for transport of supplies between the two places was taken into consideration. It was realized that a considerable amount of transport would be necessary, but if Point Cook is used merely as a flying training school, as intended, it will be a very much smaller station than it is at present. If it is used only for training purposes the present personnel will be considerably reduced. When it is a much smaller station than at present the transport to it will be very much reduced, and it is doubtful whether its volume would justify the construction of a railway from Laverton to Point Cook. The cost of transport of supplies from Laverton to Point Cook would not amount to anything like £60,000, the estimated difference between the cost of establishing the depot at Point Cook rather than at Laverton. As Finance Member of the Air Board, it would probably come within my province to consider whether materials stored at Point Cook and not utilized might not be profitably disposed of. But this is very largely a technical matter upon which, as Finance Member, I have to be guided by the reports of experts. Apart from the information which he gains from time to time, the Finance Member of the Air Board has no practical knowledge of the material, and what it is used for. If it came under my notice that material was deteriorating and was of no use for Air Force purposes, it would be my duty to see that it was dealt with. All expen-

diture on the Air Force comes under my notice in one form or another. If it were proposed to expend money unwisely it would be my duty to bring the matter under the notice of the Minister. I am there to see that money voted is spent in the way intended, and is not wasted. I cannot say that it would be my duty to suggest that a good deal of the very large supply of oil at Point Cook should be sold, in view of the statement that much of it is being wasted under existing conditions. The question is technical one. It involves the question of the reserve supplies of oil that are necessary. That is a matter which as Finance Member of the Air Board I could not determine. The custody of stores and the duty of seeing that they are properly safeguarded is within the province of the Second Air Member. If there is any avoidable wastage it is the duty of his Branch to attend to it. The question whether machines at Point Cook that are not in use might be used for civil aviation purposes is one upon which only technical officers could advise the Committee.

85. *To Mr. Jackson.*—I would not say that the establishment of the Aircraft Depot at Laverton would alone be sufficient to give the Air Force a necessary impetus. It will make for efficiency in providing for the storage and disposal of aircraft material, but it is purely an aircraft storage proposition. The Air Board has not up to the present considered the establishment of other depots. Regarding the proposal to build five-roomed weather board houses at Laverton, at a cost of £1,330 each, I could not answer the question whether that cost is justified in view of your statement that a mechanist working at Point Cook has built, opposite the Laverton site, a four-roomed house with all conveniences for £800. That is a matter on which the officers of the Works and Railways Department could advise you. I think the whole expenditure proposed in connexion with the Aircraft Depot can be justified from a defence point of view. The whole question is one of being in a state of preparedness for war. The purpose of the depot is to enable the Air Force to handle its aircraft with efficiency in any emergency. I do not think there is any other matter to which I could refer. Wing-Commander Goble has submitted to the Committee a comprehensive statement on the whole proposal, and I do not think I can add anything to what he has said. From the point of view of Finance Member of the Air Board, so far as I know, the proposal is a very sound one. I am not able to suggest anything more efficient. Finance is not the only obstacle to the scheme. The speed at which necessary works are proceeded with, even when approved, is a matter about which the Board has been very much concerned from time to time. Last year a large sum of money was voted for additional buildings at Point Cook for the use of the personnel. Owing to the procedure it took months to get that proposal through, and even after the expenditure was approved it was at least six months before the work was actually commenced. This indicates one of the obstacles to progress in matters of this kind. Such delays are very undesirable. I said, in reply to Mr. Mathews, that I would prefer if that were possible, that this work should be completed in two years instead of in four years.

85a. *To Mr. Mathews.*—The Air Board has only to do with the Air Force. The Controller of Civil Aviation under the Minister, administers the civil side of the business, but I am concerned with the finances of the civil as well as the defence side of the business. The granting of a subsidy to a contractor for civil aviation would be purely a matter of policy, on which the Controller of Civil Aviation would make a recommendation to the Minister. I would come into the matter only to see that sufficient funds were provided from which the subsidy could be paid unless the Minister required a special financial report. Beyond that I would have no jurisdiction. It would not be right to say that my duty would be only to see whether money voted has been rightly or wrongly spent. If the Minister approves of a proposal it is my duty to

see that it is carried out properly. All financial proposals have to go through the Finance Branch. If any proposal were in my opinion irregular I am in a position to submit a report on the matter to the Minister, and even to go so far as to ask the Minister to reconsider his decision, should I deem such a course necessary. If any proposal is suggested for the defence side, the Air Board reports upon it to the Minister before any money is spent upon it.

(Taken at Melbourne.)

TUESDAY, 2ND OCTOBER, 1923.

(SECTIONAL COMMITTEE.)

Members Present:

Mr. JACKSON, in the Chair;

Senator Barnes Mr. Mathews.
George Burridge Leith, Chief Architect, Victorian State Savings Bank, sworn and examined.

85. *To Mr. Jackson.*—I had had a glance at the plans of the houses proposed to be erected at Laverton, but I have seen no specifications in regard to them. They are similar to the type of houses we are building under the Housing Act and War Service Homes Act, but they are larger in area. I am emphatic when I say that a five-roomed house, suitable for a married man, can be built of timber for less than £1,330, the estimated cost of the house proposed to be erected for a non-commissioned officer at Laverton, but it must be borne in mind that the standard of work required for the Public Works Department is quite different from the class of work we are handling. Thus the departmental specification for a timber framed house might add two or three hundred pounds to its cost without increasing its capital value to any extent. I have worked out the area of the proposed house for a non-commissioned officer. It is roughly fifteen squares. A house of that size built under the specifications the Savings Bank has adopted would cost approximately £950. The difference between that amount and £1,330, the Commonwealth Public Works Department estimate of cost, must be governed by the departmental specifications. It is hard to criticise an estimate of cost. I do not know the circumstances under which it has been made, but on the specifications we are using, we could build houses for £950, £1,000, and £1,200, as against £1,330, £1,380 and £1,870, the Commonwealth Public Works estimate of houses of the same type and of the same relative areas. The houses proposed to be built at Laverton are slightly larger than those we are handling. We are building hundreds of five-roomed cottages at a maximum cost of £750, but, as I have already said, the specifications could easily add two or three hundred pounds to the cost of each house. The prices I mentioned are those for which we are building houses for artisans within the limit of the maximum of £850 provided by the Housing Act, and £800 provided by the War Service Homes Act. My whole object is to put on the market types of houses that must of necessity be built for those figures. My experience in the supervising of building construction is that the specifications under which we are building are good enough for adoption at the aircraft depot. The non-commissioned officer would represent the same standard as the artisan for whom we are building. Before the control of building houses for artisans was taken over by the Bank, the work was largely undertaken by speculative builders. These to some extent we have now cut out, and we are dealing with the major portion of organized building for artisans. Our houses are supervised adequately and are built to specification. They are not loaded in any respect. The bare necessities are provided. The accommodation is

the maximum that we can give for the money available. I could build the same houses on different specifications and load them to the extent of £300 or £400 each. We build houses in groups, and that fact has a material effect on the cost. I have just let the contract for a group subdivision at Seymour at an average cost of £675 for seventeen four and five roomed houses. There are nearly 600 contractors working under me. Of course, there are some who fall by the wayside. They are practically all working on the job, and they usually show wages for themselves and something like £30 or £40 profit for each house. I have endeavoured to create that type of working contractor. We do not build in brick. It is not possible to build brick houses under the present market conditions for a total capital cost of £350. We sometimes use Oregon, but mostly we use hardwood for joists and framing, and our roofs are covered with terra cotta tiles. On the ordinary five-roomed house the use of tiles adds £15 to the cost as compared with a galvanized-iron roof such as is proposed to be used at Laverton. I have been handling the State Savings Bank scheme of building for two years past, and we have not yet had any necessity to create a Complaints Department. Under the provisions of the Housing Act, the applicant for a home must not be in receipt of a salary of over £400 per year and must not possess another home. We are building four War Service Homes houses at Werribee. They are two four-roomed and two five-roomed houses of about the same type as is proposed to be built at Laverton, and the contract price ranges from £683 to £750. The difference between the two types of houses is that the area of the Werribee houses is from eleven to twelve squares, whereas at Laverton, the range is from fifteen to nineteen squares. The work I am doing can be taken on the basic price of £60 per square for wooden construction. That is an approximate method of arriving at the cost of a house. I have checked my figures with the tender prices—we are now advertising 200 houses a month—and my estimates do not vary to any extent from the tenders submitted. There are certain circumstances which may make the cost of one house heavier than that of another. These circumstances may be due to extra sewerage and fencing costs and so forth. Werribee is about ten to fifteen miles from Laverton, and the same conditions should apply at both places. If I were advertising work for Laverton, I would expect, and probably would get, tenders from men building at Werribee, but the man will not go to Laverton to build a single house without charging excessively for doing so. I have seen the dimensions of a house now being built at Laverton for £620. There are eleven squares in the house and the cost is slightly under the price with which we are dealing. The house in question is probably being put up by a builder without supervision. Under the Housing Act the applicant is charged 2d. per ft. for plans and specifications, and supervision. It is the number of houses we deal with that enables us to do this work for him at such a low figure. We do not build directly under Crédit Foncier. Under the Housing Act or the War Service Homes Act, the bank supplies plans and specifications of a standard type, the applicant selects his type and gets his land and then we do the rest, and charge him 2d. 4s. Before a stick of timber goes on the land the applicant knows the total cost of his house, and it does not vary. We do not deal with extras. If an applicant wants extras he can have them, but must sign an additional voucher for them. We have nothing to do with an applicant for an advance under the Crédit Foncier system except to pass his payments and exercise general supervision. The cost of building at Laverton should be 6 per cent. higher than that of building in Melbourne suburbs. In a country district, we carry out the sanitary work just as if a sewerage system were available; that is to say, all waste pipes and fittings are provided and connected with storm-water drains.

86. *To Mr. Mathews.*—Our system is conducted on a bedrock price for everything. When we commenced operations, there was grave doubt as to whether we could build houses under the maximum provided by the Act, and when I first promulgated the type houses I had the same doubt, but we have been building up our system all the time. It is all contract work. We call for tenders for the applicants, and when the tenders come in we notify the applicants of the prices submitted and then they accept them, after which the contracts are signed and work is proceeded with. I have built up a good contract system. For instance, if a satisfactory contractor has a good foreman, that foreman may start on his own account in three or four months. On these lines I have built up a fairly big system of contractors. Some of them fall by the wayside. Some of them will say that they have been bitten badly and have got nothing out of the work, but when I find that I have hundreds of contractors at work as I have now, and they keep coming back month after month for more work, I can readily say that they are not losing money on their contracts. We are getting a very fair average job out of them. If I were asked by a Government Department to build a house on the same square area as our type cottage, it is only natural that I would like to build a better house as we are now turning out. I would like to do so if cost did not enter into the question. I do not quite like the fact that we are forced by the market to build in timber. I would infinitely prefer to build 50 per cent. of the houses in brick, but I am trying to get over the difficulty by building in concrete as a medium between timber and brick. If I were asked to build a house of the number ten type, costing £700 to £750 without enlarging the room or increasing the size of the verandahs, I would not spend any more money on it to make it more suitable. There is nothing wrong with the method of construction we adopt. The only way in which we could spend more money on our cottages would be on the internal finishing. At present, if an applicant wants a porcelain bath he gets one, and in nine cases out of ten we are putting in porcelain baths. I could finish the internal joinery in hardwood as against the red oak which we used which gives a satisfactory internal joinery finish. The house we put up is a fair average job as compared with residences designed and supervised by the ordinary practising architects. If another £50 could be spent on a cottage it would be used in enlarging it. We are giving the public every satisfaction in regard to the finish of our houses, but the extra expenditure would not improve the capital cost of them. There is a market value for weather-board houses. One of the things we have to consider is the total capital cost of these places, because we are building on a fairly high market, and if we spent another £100 on a house, the owner would not show an adequate return for it. Of course, if more money were made available I would spend it in improving the finish, but I do not think that I would be thanked for doing so by the average applicant, because the total cost under which we are working is, as far as possible, suited to the average applicant who is not earning more than £400 per year, and who, certainly could not make the increased repayments which would be necessary. If I had more money to spend, I would alter the type of construction from wood to brick, and if I were confined to wood I do not think it would pay us to put a better finish in the type of houses we are building. There are no big contractors doing our work. There are some group contracts which run into £30,000, but they are taken by men who have been educated through doing other work for us. There are certainly some big contracts let under the War Service Homes Act. We often use Oregon for studs, but it is more costly than hardwood. In a house the extra cost would be from £15 to £20. At present there is a difficulty in getting seasoned hardwood. The demand is in excess of the supply for all timbers.

37. To Senator Barnes.—We supply nothing to the contractors. We do not handle materials. The contractor supplies everything. Some of the contractors have very little capital, and, as far as possible, we finance them, that is to say, we make our progress payments fairly liberal. When a contractor gets his framework up he gets his first progress payment and sometimes we give the supplying firm an order so that when the framework is up we pay 60 per cent. direct to the merchant. We must do this in order to put some of these men on their feet. It is all part of my method of getting the houses built at a minimum cost. If you adopt the system of advertising and selecting tenders you add a great deal to the cost. Men have started in a small way and gone on to bigger work. We have contractors who work to the standard, but we put them out. On the other hand we have a lot of men who have been working continually for us for two years, and have done fairly well. I always know how they are getting on by the number of jobs they can handle. The supervision of the work of construction is undertaken by a staff of clerks of works. A district inspector has charge of all work in his district. I also do a certain amount of supervision. We have been working on our scheme for about two years. We started off by building thirty houses a month. We are now building 200 a month and it is taxing us to the limit. I have ten clerks of works, but I have only a skeleton staff. It must be a skeleton staff to keep down to the cost of £4 6s. per house. We must consider our applicants. The expenses to an applicant are £15 for legal and other costs in addition to his 10 per cent deposit. Under the Housing Act he must lodge a deposit of 10 per cent of the total capital cost of the house and land. We purchase land for a man who finds the 10 per cent. If a man owns his own block he puts it in as a deposit. I would not expect the Commonwealth Public Works Department to build at Laverton in competition with my organization. The conditions are different. The specifications would be modelled for a different class of work. I could not give the estimated cost of the houses at Laverton unless I had the specifications in front of me. All I can do is to say that I know what they would be likely to cost on my own specifications. Although I am doing one class of work I am fully conversant with other classes, but to go through plans and specifications and give an estimate of cost is of very little use unless that estimate can be backed up by an actual tender. An estimate is merely the idea of a man of what a house is likely to cost. Therefore, I try to avoid giving an estimate of the likely cost of the houses at Laverton. At the same time I know at what figure I could get them built under the Housing Department.

88. To Mr. Jackson.—I can imagine what the specifications for the houses at Laverton are likely to be. When built they would probably not require so much upkeep as compared with the houses we are building. There would be stricter supervision in regard to finishing and things of that nature. If I tried to hold my contractors to a Public Works specification on small jobs like this I would not get tenders. They would not tender under those conditions. During the last twelve months there has been a gradual rise in the cost of labour and material. My own monthly schedules show me that the rise in that period is somewhere in the vicinity of 5 per cent. Some people have difficulty in getting tenders. I am very often approached by architects who are doing the same class of work as mine, and cannot get tenders. I get them because of the financial conditions, and because of the multiplicity of work I can provide. There is every indication that the cost of labour will increase. Carpenters have recently had a rise and now they are talking about getting another 6s. a week. There is a steady demand for increased wages and, so far as I can gauge the position, there is every tendency for the cost of labour to rise still further. The building

trade is abnormally active, not only in houses, but also in business places. A lot of heavy construction work was held up because people were looking for the inevitable drop in costs that did not come about, and within the last twelve months a lot of this work has been released. Nevertheless, we cannot compare house construction with general heavy construction work. There is an enormous shortage of dwellings and it is the object of the Housing Commission to overcome it. The operation of overcoming it keeps a certain type of artisans employed all the time, but that has small effect on heavy construction work. Applications for houses are about normal now, being about 200 a month on the average. A basic house of timber of fifteen squares costing from £900 to £1,000 would cost about £1,600 if built in brick. The whole trouble at the present time is scarcity of bricks. It is well nigh impossible to get them. I have had to adopt a system of orders on a firm of brick-makers. Some time back I took out the cost of our own type houses to give the Savings Bank Commissioners an idea of the cost of building in brick, and we came to the conclusion that a four-roomed basic house costing from £900 to £1,000 in wood, would cost £950 in brick. To build in brick adds at least 50 per cent. to the cost, but there again the return must be taken in a general light. A technical man cannot give correct figures for the construction of anything unless he has every particular in front of him. Bricks have not increased in price to any great extent. The difficulty is the supply. There is a congestion due to the closing down of mines owing to coal strikes, while at the same time, there has been greater activity in the building trade. Everyone wants bricks, but everyone cannot be supplied. I have a system whereby I issue an order on the Co-operative Brick Company, and they supply each contractor. The position is that the brickmakers do not know much about the contractors or about their financial position, and, therefore, they are not too eager to supply them with bricks. My method overcomes that difficulty. Of course, it leads to a certain amount of accountancy work in the office. You can get a better result in a timber-frame house if the work is not done departmentally. The men who are doing weather-board construction are not the same class as those who are doing heavy construction in brick. The man who is building to standard specifications knows what he is doing, but if he is asked to build the same house with a slight alteration outside, and he is made a departmental affair, he will add £100 to his tender. I realized when I first started this scheme, that if we put any idea of departmentalism into the work we should add considerably to the cost. It would be an advantage to let the whole of the work at Laverton in one big contract. In individual cases of cottages, the Government might do better by letting separate contracts, but my experience, since taking over the work of building War Service Homes, is that when I called for tenders for group work the average cost of building houses was about 5 per cent. less than that of building houses as separate units. It pays to let tenders for groups of houses. Therefore, I should say that at Laverton, a self-contained job such as is proposed to be taken in hand there could be let in one contract to a big contractor.

89. To Senator Barnes.—The work at Laverton should lend itself to concrete construction, but in that regard it is questionable whether the material available would enable the work to be carried out satisfactorily. Concrete work has to be standardized. I propose to build concrete houses under my scheme as a medium between timber and brick. The Government could get alternative tenders for wood and concrete. If concrete is used the saving in upkeep will probably compensate for the added initial cost.

(Taken at Melbourne.)
THURSDAY, 4TH OCTOBER, 1923.
(SECTIONAL COMMITTEE.)
Members Present:
Mr. JACKSON, in the Chair;

Senator Barnes, Mr. Mathews

John Smith Murdoch, Chief Architect, Department of Works and Railways, recalled and further examined

90. To Mr. Jackson.—The estimate made by the Commonwealth Public Works Department of the cost of the cottages proposed to be erected at the Aircraft Depot, Laverton, is based on the Department's experience in the construction of exactly similar houses at Point Cook. The cottages under construction at Point Cook are included with other buildings in a large contract for which tenders were called a few months ago, with the result that the highest of five tenders was £59,280, and the lowest £19,894, against the departmental estimate of £45,855. Dissecting the tenders in order to ascertain what the tenders had included for the cost of the cottages, which are similar to those proposed to be erected at Laverton, I find that the highest tender for the smallest type was £2,148, and the lowest £1,820. The tenders were all higher than the departmental estimate, although there was fairly good competition with a variation of £10,000 for the whole group between the highest and lowest tender. We do not assume that the £1,820, the tender price for the smallest cottage at Point Cook, is a fair value for the cottages proposed to be erected at Laverton, and we have estimated that the smallest cottage at Laverton can be built for £1,330. We believe that we can save about £70 on each cottage at Laverton by not providing for the fencing that is included in the Point Cook contract. There will also be a saving of freight and possibly a saving in the cost of labour for the Laverton depot will not be as great as that at Point Cook. The contractor for the Laverton depot will be obliged to pay a living allowance of 2s. 6d. per day to each man employed. The Point Cook contractors and the Department have been obliged to pay a living allowance of 1s. a week to workmen and have also had to provide accommodation for them. If workmen travel up and down from Melbourne to Laverton they will have to pay railway fares and travelling time, so that it will probably be cheaper for the contractor to pay them a daily allowance and keep them on the job. We have cut down the estimate for the cottages at Laverton as compared with those at Point Cook, which are actually costing £1,820, including fencing. I understand that the members of the Committee have inspected the houses being built for soldiers by the State Savings Bank. If I mention some of the items we are specifying for the houses now being built at Point Cook, the Committee will be able to follow the quality of work we are giving and compare it with what the Savings Bank is providing. First of all our cottages are larger. We provide 4-in. x 4-in. stumps; 5-in. x 5-in. bearers; 4-in. x 2-in. joists; 4-in. x 2in. studs; 3½-in. x 3½-in. floor; hard-wood weather-boards; 24 gauge roofing iron; lath and plaster walls; hoop-pine ceiling instead of plaster for a large portion of each house; 6 dado in each kitchen; fibrous plaster ceilings; louvered eaves and gables; built-in wardrobes, linen cupboards, presses, &c., 20 gauge iron down pipes; 26 gauge glass; mantles and grates (including fixing) £12 10s. each; a one-fire stove, 27; a portable copper, £6 10s.; a porcelain enamel bath, £9 10s.; bath screen, £4 10s.; lavatory basin, £3 10s.; fireclay sink, £3 10s.; holland blinds, £8; door furniture (locks, spindles, handles, hinges and finger plates), £1 10s.; a set; electric lighting (9 points), £25; stovero, £4 10s.; cyclone fencing, £6; tar-paved foot-paths and kerbing, £40; and surface drains. If the cheaper finish employed by the State Savings Bank were adopted we should probably be able to build just as cheaply and economically as they are doing, but the fittings that I have just mentioned will show the Committee that we are not proposing to build the same kind of house as the bank is erecting. I am aware

that the bank is having houses built at £60 per square. The Point Cook house which I have mentioned would work out at £122 per square if all accessories, garden paths, &c., were included. The locality in which a house is erected has to be taken into consideration. The contractor has to add £1 per week extra for each man when building at Point Cook as compared with the price he would pay to his hands in Melbourne, in fact it must cost him more than £1, because he has to provide accommodation. The life of any house after it is built it should have an indefinite life. They are all built of hardwood. I could make them cheaper by using Baltic weather-board, but I have already promised the Committee that I would use Tasmanian hardwood. I suppose that a tiled roof would cost £15 more than a galvanized-iron roof. I do not think that the Public Works Department could erect the houses at Laverton at £950, £1,000, and £1,200, which Mr. Lettis says would be their cost if built on the standard of the State Savings Bank houses. At any rate, I do not think we could do it at that locality. I do not know that Mr. Lettis was speaking on actual experience when he said that the increased cost in outside localities, as compared with the metropolis, does not exceed 5 per cent. Possibly the houses he has had built at Laverton were done by a local contractor. I think it would be very wise for the Committee to suggest that the contract for the domestic buildings at Laverton should be separated from the contract for the main construction. I find that when the Government are providing a home for a man, he wants all sorts of considerations which he would never dream of getting if he were spending his own money. I think that the difference between wooden construction and brick construction is about 12 per cent. In the smallest house at Laverton there would be about eight rods of brickwork which would probably cost about £50 per rod. I could not understand any one saying that a house which would cost £300 when built in wood would cost £1,600 if built in brick.

91. To Mr. Mathews.—If the Government did not provide blinds, footpath, sewerage fittings and such things as are not supplied by the State Savings Bank it would make a difference of more than £100 per house. I do not think that the State Savings Bank would use 24 gauge iron on the roof. Its houses are smaller than ours. It must be borne in mind that the occupant of one of our houses would be required to spend less on furniture than he would otherwise have to pay. I have mentioned that we propose to provide built-in wardrobes, linen presses, &c. Where the Naval and Military Officers require a man to stop for two or three years in a certain place, it would be ruinous to expect him to provide his own heavy furniture. Take the case of the Naval Officer who used to come out from England and live in one of our houses for three years. We could not put him in an unfurnished house. The Government provided heavy tables, chairs and linoleum and charged each officer 6 per cent. per annum on the capital cost of these furnishings which were additional to the actual fixings in the building. To get a return of 7 per cent. on a house costing £1,300, the Government would need to charge a rental of 29s. per annum. In order to cheapen the houses at Laverton as compared with those at Point Cook, a £2 10s. bath might be installed instead of a £2 10s. porcelain bath, but I am afraid that in the course of two years, we should be obliged to send down a plumber, at a cost of £1 15s. per day, to fix it up. There would be no economy in doing that. For the same reason we are taking the precaution to use 24-gauge iron roofing and 20-gauge iron spouting. I would rather pay £20 more to have the heavier stuff and save the cost of upkeep. In Queensland, where

cheap house building has been brought down to a fine point 26-gauge iron is not used, whereas it is used in practically all Victorian construction. In Queensland, 24-gauge iron is used. It is economical to use the heavier iron. I think that in Queensland, the heavier iron is used because of the heavy hall-storms encountered there. If the Committee suggested letting the contract for the cottages at Laverton apart from the main contract, and that the lowest degree of construction consistent with fair durability should be observed, the men accustomed to building small houses might tender. Big contractors do not like being bothered with too much detail, and it is quite possible that on that account they have put in slightly higher tenders than they might otherwise have done for the Point Cook building. I know that there is a certain amount of understanding between builders, that one will not care to take on work on the same site as another builder, but I do not think that the Government should recognise reasons of that kind. Instead of cutting down the finishings we might possibly get the estimate a little lower by letting a contract for the domestic buildings as a separate matter.

92. *To Senator Barnes.*—If the upkeep of a house is maintained, there is no reason why it should not last for 100 years, particularly if concrete blocks are used instead of hardwood. I would like to use concrete blocks, although they are a little dearer, but every item increases the aggregate cost.

93. *To Mr. Jackson.*—I think we can do away with fencing inside the depot at Laverton. We might adopt the American garden system and have the allotments subdivided by hedges. In regard to the house occupied by a mechanician at Laverton which contains four rooms, with a bathroom and verandah, and cost £620, I think it will be found that it is exactly the same class of construction as has been adopted by the State Savings Bank. I have not seen the State Savings Bank houses, but the houses it erects are very small. I am aware that Mr. Leath has made the general statement, that under his system a house of the size we propose to build at £1,330, would cost £950, but my figures are based on the actual experience of putting up a house of this type at Point Cook, for which the lowest of five tenders was £1,820, and the highest, £2,181. The Public Works Department can build as cheaply as any one else if the occupant of the house put up for him would be satisfied with what was provided. Ask any Government employees if the houses provided for them are comfortable, and you will find complaints in every direction. Take the Canberra houses which we think have cost more than is justified, and more than the amount for which the rent charged provides a suitable return. The majority of the occupants are full of complaints. If they were living in their own houses in town they would probably have less accommodation at twice the rent. I think we ought to keep costs down as low as we can, and perhaps we can cheapen our specifications. We have already cut down the estimate as compared with the actual cost of houses at Point Cook. Our estimate for Laverton is 17s. 6d. per square foot. The houses at Point Cook work out at £1 4s. 6d. per square foot.

(*Taken at Melbourne.*)
FRIDAY, 5TH OCTOBER, 1923.
(SECTIONAL COMMITTEE.)

Present:

Mr. JACKSON, in the Chair;

Senator Barnes | Mr. Mathews.

Sir Henry George Chauvel, G.C.M.G., K.C.B., Lieutenant-General, Inspector-General Australian Military Forces, sworn and examined.

94. *To Mr. Jackson.*—As Acting Chief of the General Staff, I am cognisant of the essential details in connexion with the proposed aircraft depot at

Laverton. Until I became a member of the Air Council I was not *au fait* with the Air Board's proposals for future development, but I agree that a depot of the description proposed to be established at Laverton is vital in any scheme of defence. The advantage of the Laverton site may be summed up in the fact that it is close to the second largest industrial centre in Australia, the ground is suitable, and the locality is reasonably safe strategically. There can be no doubt as to the justification for a depot. We must have an Air Force, and therefore we must have a main depot or base. An Air Force is an essential adjunct of the military and naval arms of defence and, as such, must be developed side by side with them. It is an essential adjunct, only because potential enemies have given attention to this arm of offence and defence. We must do likewise. The minimum war strength to be provided for the army should be twenty-one squadrons of eighteen machines each, and the nucleus in peace should be four permanent squadrons of twelve machines each. The development of the scheme will include the establishment of a number of sub-bases in various parts of the Commonwealth; but for the present it will be sufficient if we confine our attention to two or three of the States. In my opinion, the depot at Laverton is essential. I am aware that it is proposed to spread the expenditure over a period of four years. The present arrangements for the storing of machines and material are most unsatisfactory and uneconomical. At the moment I cannot think of any site that offers greater advantage than Laverton for a depot, but I have not inspected any localities with this end in view. It is essential, in connexion with a depot of this character, to have it located reasonably near an important industrial centre in order to insure a sufficient supply of labour, and also adequate accommodation for the employees if they are not housed by the Commonwealth. In the event of war in Australia it is extremely probable that the Defence authorities would take over existing facilities, such as landing grounds, and a considerable proportion of air men belonging to or employed by civil aviation companies. I am aware that in the development of an Air Force for war purposes the authorities look to men engaged in civil aviation to supplement the personnel necessary to carry on warlike operations, and I have read in newspaper statements to the effect that the Imperial authorities have given attention to the new machines which, it is claimed, are best suited for commercial purposes in peace and still better in war. My experience, however, is that machines employed for commercial work are not of much use in war except for the transport of a limited number of troops, wounded men, and even supplies, or for night bombing.

95. *To Senator Barnes.*—I have frequently discussed with naval authorities the possibility of a future war in which Australia might be intimately concerned, and I am aware that, in their opinion, any naval engagement is likely to take place at least 1,000 miles from the Australian coast. I think that is more than probable. But this does not mean that there is no necessity for an Australian Air Force, because our scheme provides for a certain number of squadrons being attached to the Australian Navy. We are expecting to train aviators for service with the Navy and to have attached to the Australian Fleet aeroplane carriers. It does not necessarily follow, of course, that because Naval authorities expect any naval engagement to take place more than 1,000 miles from Australia, their prediction will prove correct. My opinion may be that we shall have to fight north of New Guinea, but a hostile naval power may avoid a naval action and endeavour to raid Australia. Therefore, aeroplanes and seaplanes operating from sub-bases would be an essential arm of defence. We must have a depot or base for our Air Force establishments. The Navy will eventually require fifteen squadrons of seaplanes or flying boats. Although there is a considerable number of mechanics employed at Point Cook it does not follow that, in the development of the Air Force, their numbers will be correspondingly increased. It is difficult to say just

how many will be required to complete the peace establishment, but the existing number of mechanics would not be multiplied in the same ratio as some people seem to think. We must have a certain number trained for the care of machines, and they must be kept employed, irrespective of the number of machines in use. The Laverton depot must not be regarded as the strategic base, but the home of the Air Force, and, sooner or later, as the scheme develops, we must have subsidiary strategic bases near Sydney and elsewhere.

96. *To Mr. Mathews.*—It is difficult to say what the strength of the Australian Air Force will be eventually. Everything will depend upon the world situation. At the moment we are not asking for more than four squadrons, as a peace-strength nucleus. If the world situation becomes unfavourable we may recommend an expansion of the Force, and have subsidiary bases as suggested. I am afraid that land aeroplanes would be values for reconnoitring purposes at sea, because their radius is not more than 450 miles. Personally, I hope that, in the development of our Air Force, our pilots will have every opportunity, in peace time, of enlarging their experience by being called upon to do all sorts of odd jobs, such as conveying doctors or nurses to out-back localities and any other work of an unusual nature; but ordinary routine work, such as running of mail services, would be of little value from a military point of view. It would be very much like training cavalry or dragoons marches backwards and forwards along a given road.

97. *To Senator Barnes.*—In war time the British Navy authorities recruit from the mercantile marine and likewise in war time our Air Force would expect to recruit the Air Force from the commercial aviation companies in Australia. I am sorry that commercial aviation is not developing as rapidly in Australia as in other countries. I know something of the aeroplanes that are stored at Spotswood, and I am afraid that, owing to the lack of attention, a considerable quantity of the material will be of little value in five years' time. I would not go so far as to say, however, that the aeroplanes will be valueless by the time the Laverton building programme is completed, for I assume that as the various stages of the work are finished, those responsible for the machines and material will have them overhauled and stored at Laverton. I have seen Wing Commander Goble's report concerning the aeroplanes that are in store at Spotswood, and I know that the present position is unsatisfactory.

98. *To Mr. Jackson.*—I should say that the development of commercial aviation in Australia is retarded owing to the fact that our population is not large, and that there is not sufficient inducement in the way of passengers and goods to warrant an increase in the number of existing air services. What we want is to get in touch regularly with Wyndham, Darwin, Camooweal, and a number of other distant places in Australia, but unfortunately at present this is not commercially possible. To some extent, therefore, the subsidy being paid to the existing commercial air services may be regarded as a defence expenditure. It was with this object in view that, some years ago, I recommended to Senator Pearce, who was then Minister for Defence, that the Government should render some assistance to civil aviation. I am in favour of an extension of this policy, and of giving every assistance possible to commercial aviation so long as this is not at the expense of the military and naval branches. If the Victorian Savings Bank authorities as in a position to build suitable houses at Laverton for £1,000, as compared with an estimated cost of £1,800 by the Commonwealth Department of Works and Railways, it would be wise to reconsider the whole position. My view is that, in connexion with a permanent establishment like the Laverton aircraft depot, the erection of timber houses is extremely inadvisable. It seems to me to be false economy to build in wood, and I am sorry to learn that it is proposed to erect wooden dwellings there. Laverton will be the base for all time, and the buildings, to be permanent, should be constructed of brick.

(*Taken at Melbourne.*)

FRIDAY, 26TH OCTOBER, 1923.

Present:

Mr. GREGORY, Chairman;

| | |
|----------------|-------------|
| Senator Barnes | Mr. Cook |
| Senator Lynch | Mr. Jackson |
| Senator Heid | Mr. Mathews |
| Mr. Blakely | |

Frederic Edward Theodore Cobb, Sanitary Engineer, Public Health Department and Commission, Victoria, sworn and examined.

99. *To the Chairman.*—The site of the Laverton aircraft depot is in proximity to the area indicated on the plan before the Committee as a site reserved for what are known as "offensive" trades, which are enumerated in the Second Schedule of the *Public Health Act* 1919. These include abattoirs, or slaughter-houses, and certain trades associated with them and dealing with animal matter in some form, such as boiling-down works for the manufacture of manure and recovery of fat, blood and bone boiling works, and blood-drying works for the production of blood manure, bone-milling works, stores for hides and skins, and hoofs, hair, or bones, and trades dependent upon these again, such as tanneries, fellmongers, wool-washing establishments, glue works, &c. These and several others, described as "offensive" trades, are connected with abattoirs as a centre. They are mentioned first because, in Melbourne, something like 2,750,000 cattle pass through the Flemington yards every year, and a large proportion of them is slaughtered at the Melbourne City Council's abattoirs. Therefore, the establishment at Laverton of what may be described as "offensive" trades dependent for their supply of raw material upon abattoirs, would inevitably follow the transfer of the large slaughter-houses from the metropolitan area to that locality. In addition, certain trades which are defined as "dangerous" and are capable of being in some cases also "offensive" are listed in the Third Schedule of the same Health Act. They comprise such enterprises as arsenic recovery works, chemical manure works, match factories, metal grinding or polishing works, sulphuric or hydrochloric acid works, and white-lead works. The authorities have power to add other trades which may be considered to be in the same category. Recently, under exercise of similar power, poultry-killing has been proclaimed to be an "offensive" trade, and it might be carried on at Laverton, assuming that the Government decided that all "offensive" trades should be segregated there. Connected with the whole project would be the collection, from the metropolis, of all the more or less stale offal which is cast aside in butchers' shops, such as pieces of bone, fat, &c., which have commercial value and which, in the course of collection, would become increasingly stale before it left the city, and arrive at Laverton in a more or less tainted condition varying with the weather. All this waste material would be treated in the noxious trades area for the by-products. Section 83 of the Act governing the treatment of such waste material reads—

Every person carrying on any trade producing or causing or emitting or discharging any effluvia, offensive fumes, vapours or gases or dust, blood, foul liquid, or other impurity, shall provide for the removal of such effluvia, fumes, vapours and gases for preventing such trade being carried on so as to be or become a nuisance or dangerous to health or for mitigating the offensiveness thereof.

In the definition section of the Act "offensive" includes "noxious". Some offensive trades are more definitely noxious because of the possibility of poisonous or corrosive emanations. Chemical manure works, for instance, are in a distinct class of "manure" works, and differ from the ordinary bone manure or blood manure works because in the process of manufacture the phosphates are converted into the finished product by the application of sulphuric acid. Hitherto the

Health Commission has not attempted to separate the classes of trades by localization. They are both subject to registration. "Offensive trades" must be registered by the local municipal council in whose area they are situated, and "dangerous trades" by the Commission so that the Commission exercises a closer direct control over "dangerous trades" than over trades which are merely "offensive." I should say that, if not managed carefully, some of the dangerous trades specified in the third Schedule to the Act could be injurious to life. From many of the "offensive" trades, for example, from pigsties, boiling down works, soap and candle factories, glue works, and manure works generally, the trades could be so offensive, if the works were not properly managed, that people living in the vicinity would be obliged to close their windows, thus interfering with the proper ventilation of their houses, and thus affect the ordinary comfort of life. I am not at liberty to anticipate what may be in the mind of the Government as to the segregation and regulation of noxious trades in the Metropolitan Area, and, therefore, I cannot say whether and when action will be taken, but may express the opinion that if "offensive" trades were transferred to the area proposed to be reserved for them, it would only be a matter of time before complaints were received concerning the nuisance if the works were not efficiently controlled.

100 *To Mr. Mathews.*—Municipal councils have authority to grant permission for the erection of works for offensive trades within their municipal boundaries, but if such trades are not properly controlled, and if ratepayers, after complaining to the local municipality, do not get satisfaction within a reasonable time, the Health Commission takes the matter up.

101 *To the Chairman.*—Assuming that either "offensive" or "dangerous" trades similar to those in operation in the region of the Maribyrnong River were established in the area adjacent to the aircraft depot, I should say that the escape of effluvia or other emanations owing to the concentration of such a large number of trades in one locality, might easily cause discomfort to people working at or living near the aerodrome. If there were carelessness in the operation of processes for the treatment of organic or other matter, the escaping fumes would cause great inconvenience to the people in that neighbourhood and might indirectly affect their health. I do not apprehend that there would be any complaints concerning the present main outfall sewer, because it is some distance from the aerodrome site. The noxious trades in question have been subdivided into different sections. Portion of it has been reserved for the housing of the population that will be connected with the trades. There has been a considerable extension in recent years of the areas required for the carrying on of noxious trades in Melbourne, and under present conditions is likely to continue. It is quite likely that, if noxious trades are segregated as suggested, what are known as "dangerous" trades will also be located there. Arsenic recovery works, if not properly managed, can be exceedingly dangerous, but nowadays there is no reason why they should be. I should say that the aerodrome should be situated not nearer than 2 or 3 miles from a noxious trades area. This distance should be sufficient to counteract any effects from the most obnoxious of the trades likely to be established in such an area, and may be regarded as reasonable provision for the dilution of the dangerous or offensive effluvia escaping from the chimney-stacks.

102 *To Senator Reid.*—The Commission has very complete power in the matter of proclaiming a noxious trade. In section 42 there is this provision—

The Governor in Council, in respect of any municipal district, by proclamation, define localities therein in which it shall not be lawful, or localities in which it shall be lawful to establish or after a period of notice to carry on any offensive trade specified in the proclamation.

103 *To Senator Lynch.*—Up to the present no attempt has been made by the Commission to remove any particular noxious trade from the Metropolitan Area, but it is inevitable that action in this direction

Curiously enough, that section does not make any reference to what are termed "dangerous" trades. Any person desiring to establish an "offensive" trade must first approach the local municipal council and advertise his intention for one month, before the council gives its decision, thus affording other persons an opportunity of objecting and, if necessary, appealing to the Health Commission to prevent the local council giving permission for the establishment of the works. I have not heard of any recent complaints from Yarraville, where so many of the works are at present established. In order that every precaution may be taken by the Public Health Commission to minimize the objectionable features of any such trades, that body has had before it for some time a draft copy of stringent regulations which, if approved, will be applicable throughout the State. The tendency is to tighten up the control by regulations, because mechanical facilities for the control of offensive fumes, &c., have reached a very high degree of perfection during the past ten years or so. Hence it is simply a matter of the management spending the necessary money to equip the works with the most up-to-date machinery.

103 *To Mr. Mathews.*—Stone-crushing could hardly be considered as *per se* a noxious trade unless the appliances for minimizing the escape of dust were so imperfect as to cause a nuisance to the people living in the vicinity. Generally speaking, if only one or two people complained of nuisance in respect of any particular trade the nuisance would be regarded as a private one, but if a considerable number of people were adversely affected, and the nuisance of frequent occurrence, it would be competent for the Public Health Commission to recommend the Governor in Council to include such trade under the heading of offensive trades. It would then be subject to regulations made under the Health Act. In the Health Act 1916, trades were included in this list of offensive trades, but are omitted from the present Act. In the event of tunnellers not conducting their processes properly, however, the Governor in Council will have authority to include the trade in the schedule of offensive trades.

104 *To Mr. Blakely.*—I think it probable that if the whole of the noxious trades of Melbourne were segregated in the area adjacent to the aerodrome, as proposed to be located, the resultant emanations would be offensive to the people living there and to employees of the depot, because there would be an inevitable residual of odour, &c., respecting the sum total of the escaping foul vapours, gases, &c. if only from the transport of raw material in a more or less putrescent condition. And if there were carelessness as to the sanitary design or condition of the vehicles carrying the refuse along the road past the houses, it is more than probable that many complaints would be made. I am not in a position to say who selected the site as the future home of the noxious trades in the metropolitan area, but, as secretary to the body, I know the matter was referred to what was known as the Noxious Trades Site Board, members of which investigated certain areas, and made recommendations. The whole proposal is somewhat in the clouds at present. All we know is that the Government issued instructions that a certain area should be inspected and reported upon, and this was done by the end of November, 1919. The understanding was that the area should be within about 10 miles of Melbourne and, having in mind the principal stock routes, in a north-westerly direction from the city. The area reserved is 14½ miles from the General Post Office, Melbourne, by road. At present the majority of the more potentially offensive trades of the metropolis are situated in the region of the Maribyrnong or Saltwater River, and the proposal is that some day they shall be segregated in a special area.

105 *To Senator Lynch.*—Up to the present no attempt has been made by the Commission to remove any particular noxious trade from the Metropolitan Area, but it is inevitable that action in this direction

shall be taken some day. The area referred to has not been definitely appropriated by proclamation. So many factors have to be considered in connexion with the subject. So far as I know, the proposal has not yet got beyond the suggestion stage.

106 *To Mr. Mathews.*—A municipal council has authority to give or withhold permission for the establishment of an "offensive" trade within its boundaries, subject, of course, to there being no objection from the local residents in the former case.

107 *To Senator Lynch.*—If residents complain or raise objection to the establishment of a noxious trade, and if the local council gives them no satisfaction, they may appeal to the Public Health Commission, which is the final authority. There have been cases of a municipal council overriding the objections of ratepayers, who thereupon appealed to the Central Health Authority, which, in some cases, reversed the decision of the local governing body. Dr. Edward Robertson, D.P.H., is the Chairman of the Commission, and the other members are Dr. W. E. Summons, Dr. W. S. Newton, Mr. R. de C. Wilks, J.P., Councillor J. H. Currow, J.P., Councillor J. Hancock, J.P., and Mr. B. A. Smith, M.C.E. I am Sanitary Engineer both for the Department and the Commission. The prevailing winds at Laverton are similar to those in Melbourne, and as the Laverton aircraft depot is practically bounded on the west, north, and east by the proposed noxious trades area, it is highly probable that there would be an "overflow" of effluvia, &c., in that particular area all the year round. It would not be a popular pleasure resort.

108 *To Mr. Cook.*—A great deal of consideration has been given to the question of moving the noxious trades from Melbourne and segregating them in a certain area, but the Public Health Department is entirely in the dark as to when action in this direction is likely to be taken. I shall say that if the noxious trades were established in the area proposed to be reserved for them, the site for the aircraft depot would not be suitable from a public health stand-point.

James Richard Collins, Secretary, Commonwealth Treasury, sworn and examined.

109 *To the Chairman.*—The Commonwealth Tender Board is composed of several senior officers of the Commonwealth service. I am the chairman. The other members are Mr. Oxenham, permanent head of the Postmaster-General's Department; Mr. McLaren, the permanent head of the Home and Territories Department; Mr. Bingle, the permanent head of the Works and Railways Department; Mr. Deane, Secretary of the Prime Minister's Department; Mr. Trumble, Secretary to the Department of Defence; and Mr. Ramsay, of the Department of the Navy. The power to appoint the Board is contained in the Public Service Act, and the duty of the Board is to control purchases by the various Departments. The Board has authority to deal with all classes of stores, but has not extended its functions beyond dealing with stores that are common to two or more Departments. It does not touch stores of a technical nature required for any particular Department. Generally speaking, the heavy purchases other than stationery and such articles, are dealt with by the Departments concerned. The Board is not intrusted with the duty of dealing with tenders for public works. I believe that the same arrangement obtains in connexion with the States Boards. The Secretary of the Commonwealth Tender Board is a Treasury officer who acts under instructions from the Board. He is not a specialist, but we have a specialist in Mr. Little, Controller of Stores in the Postmaster-General's Department. He advises the Board in connexion with all technical matters, and attends its meetings. I am perfectly satisfied with the Board as at present constituted. It has more than justified its existence, and has been able to effect con-

siderable economies in departmental expenditure. I do not think it would be possible for the Secretary to the Board to have a special knowledge of the technical requirements of all Departments. We might have as secretary a man who knew a very great deal about the Postmaster-General's Department, but even he would not be conversant with all the requirements of that Department. His experience, if of any great value, would be along one line, and in respect of other matters he should possess general business qualifications. As to the proposal that the secretary should be a man of wide commercial experience, I should say that the Commonwealth Public Service is a business organization of its own, and it is not likely that a man outside the Department would know nearly as much the Commonwealth's requirements as would a man trained in the Commonwealth service. I am satisfied with the arrangement that the secretary should be a Treasury officer associated with Mr. Little, the expert to whom I have referred. The Secretary to the Board is really a clerk, and Mr. Little, the Controller-General, is the technical adviser to the Board. In the case of stores being supplied to Departments in the different States the responsible officer in a Department would see that they were up to the standard, and were in accordance with the specifications. In each of the States there is a Tender Board constituted similarly to the Central Board, and subordinate to it. I think advantage would probably be derived from an arrangement which permitted representatives of a Department concerned being *ex-officio* members of the Tender Board when dealing with matters closely affecting their Department. They could advise other members of the Board in connexion with technical details. It would be wise to have the advice of the technical officers scrutinized and tested. This would probably inspire suppliers with confidence, because however well informed a technical officer may be, he may have an undue leaning in certain directions. If the duties of the Board were extended, or if another Board were appointed with wider powers, it would be necessary to appoint a permanent secretary, and preferably a man with commercial experience. I have noted that at times individual officers exercise very wide authority in incurring expenditure. I have never seen that authority misused, but it would be salutary, and result in economy if there were control of expenditure by a permanent Tender Board with a secretary of wide commercial experience.

110 *To Senator Lynch.*—The Tender Board is under the control of the Prime Minister. If we sought to extend its functions we should have to get his approval. We have not the power automatically to extend the functions of the Board. We have authority over the expenditure of all Departments, excepting the Commonwealth Bank and the Commonwealth Line of Steamers. We have not extended our powers, because the feeling of the Departments has been that technical knowledge in the handling of tenders is vital, and that interference by other Departments would not be in the best interests of the Government. I think the present arrangement could with advantage be superseded if the Board had included commercial men and had a permanent secretary. I do not think that the departmental duties suffer to any extent by the present arrangement, but of course the duties of the Board are heavy. We always meet outside of office hours. That is the only way in which we could do the work without interfering with our departmental duties.

111 *To the Chairman.*—I was not particularly anxious to be employed upon this work, but it was the wish of the Government that I should be associated with it, and I offered no objection. I certainly could not discharge the duties in my ordinary office hours. I cannot see any immediate prospect of the Board extending its power in the near future. If strong representations were made I believe the Government

would authorize an extension of the Board's powers. There are departmental objections to this course, but these objections could be overcome by the Government.

112. *To Mr. Cook.*—In certain cases approval of tenders is given by the State Tender Board. We do not touch tenders for supplies other than those that are common to two or more Departments. For instance, we would have nothing to do with the acceptance of tenders for telephone switchboards for the Postal Department. That matter would be dealt with by the departmental Tender Board. If I were asked to do so I think I could offer useful suggestions to improve the existing conditions. The presence on the Board of a man with commercial experience would greatly help in coming to a decision, for although he might not have special technical knowledge, his sound business judgment would be helpful.

The witness withdrew.

John Goldsworthy White, Secretary and Executive Member of the Victorian State Tender Board, sworn and examined.

113. *To the Chairman.*—The Tender Board is constituted by regulations under the Public Service Act. It consists of the heads of the principal spending Departments and the secretary who is also one of the members. Originally the Board comprised fifteen members, but it then proved unwieldy owing to the difficulty of getting a continuity of attendance, and on the recommendation of the Economy Commission the number was reduced to five, nominated by the Public Service Commissioner. The Board has authority to seek advice from any engineer or technical officer when dealing with tenders for special work. It deals with the purchases of stores and material for the various Departments, excepting the Railways, the Electricity Commissioners, the State Rivers and Water Supply Commission, the Country Roads Board, and the Forests Commission. These have their own arrangements and work independently of the Tender Board, but in regard to most of the purchases, all excepting the Railways and Electricity Commission avail themselves of the stores and transport regulations of the Public Service Act. We do not deal with tender for the erection of buildings or works of that nature. They would come under the purview of the Board of Land and Works. The Board is constituted for the handling of tenders for stores and materials only. I have been associated with the Board for 39 years, and have been its secretary for thirteen years. I was selected because of my long experience in connexion with the work. If the Commonwealth Government decides to create a new Supply and Tender Board with wider powers it should, in my judgment, be possible to select suitable men, including the Secretary from within the Service—men with a technical knowledge of stores and familiar with the contract system. I should say it would be advisable to have as a permanent secretary a man of wide commercial experience and highly qualified. In pre-Federation days supplies for the Commonwealth Departments were controlled by the Tender Board excepting, of course, electrical equipment and material of that nature required for the Post and Telegraph Department and also certain requirements of the Department of Defence, particularly munitions. These have always been considered a section of the Service apart, and purchases of that nature have been dealt with by special departmental Boards. But copper wire was included in the State schedule for many years.

114. *To Senator Lynch.*—The question of extending the authority of the State Board to include the acceptance of tenders for supplies for the Water Supply Commission and the Forests Department has been under consideration from time to time. The Board is desirous that all Departments should be under its control, that is in connexion with the purchase of material of a general character and common to all Departments. We consider that the Board has been

able to effect considerable economies through the consolidation and standardization of supplies. One of the principal objections against the present system is that those Departments outside the jurisdiction of the Board are to some extent competing against one another and buying at varying prices. This matter has been referred to on several occasions by the Auditor-General, who has recommended that the purchase of general supplies should be under the control of one body. I may illustrate what I mean by stating that the last commodity to be commented upon was the purchase of cement by the Country Roads Board and the State Rivers and Water Supply Commission. The Board's contract provides that the contractor shall deliver free on rails within 5 miles of the General Post Office. We found that the Departments mentioned were buying at varying rates, although when freight and storage were taken into consideration there was not a very great difference between their prices, but the method was unsatisfactory. The extra duties imposed upon the members of the Board do not interfere with their departmental work. We have not felt the necessity for the inclusion of men with commercial experience on the Board, but when drawing up a schedule the Board authorizes me to get into consultation with the technical officers of the Department on whose behalf the goods are being obtained. We then go through the schedule, and in order to meet the requirements of the trade we usually consult with an outside authority so that we shall not specify a class of material that might be difficult to obtain in the open market. And if we feel that there is any likelihood of a specification giving monopoly to an outside firm we consult other firms in the trade, and act accordingly. During the past three years we have utilized the Agent-General's office in London in connexion with the supply of cotton goods only. So far we have confined advertisements of our tenders to our own State, although opportunity is given to other States to come in. With regard to cotton goods we found the local price so high that we got alternative quotations by cable from London, and were able to effect a saving of £650 on about £7,000 worth of goods. It was suggested that we would be able to do better by indenting our own cotton goods direct, but after consideration we came to the conclusion that the percentage of profit in normal years was not unduly large, and the Board has always taken the stand that, if possible, it is a fair thing to give preference to our own merchants, provided prices are reasonable. I can safely say that the Board has amply justified its existence, and the tendency is to increase its authority. We have never had any complaints from the commercial community concerning the operations of the Board. The contracts are gazetted, and we throw full responsibility on the supplier and the authorized officer receiving the goods. If the goods are not in accordance with the specifications they are rejected. Recently there was some trouble in connexion with varnishes for the Public Works Department. The Board on receipt of tenders also called in a special expert to test the varnishes, and to see if they were up to the specifications, and got a report from the officer of the Department for which we were purchasing. We came to the conclusion that the chief architect of the Public Works Department was justified in challenging the tender, and in that case we turned down the lowest tender. Ordinarily if there are no reports as to the quality of the article supplied we assume that the supply has been up to standard, and we recommend the acceptance of the lowest tender. We have the services of an official known as the Inspector of Officers in charge of Stores and Material. He makes annual inspections, and reports to the heads of the various Departments as to the condition of stores. Only last week in connexion with the supply of meat we had occasion to fine a contractor, but as a rule we find

that tenderers lay themselves out to comply with specifications. We throw upon the tenderer the entire responsibility, and if we reject a commodity we advise the contractor who has to replace the goods within 24 hours, failing which we have the right to purchase at his risk goods of the quality specified. In my opinion the Commonwealth Government should utilize the State Boards for goods common to State and Commonwealth Departments. This would be a more expeditious and cheaper method of obtaining supplies. We have never charged the Commonwealth a penny for this service, but New South Wales has charged 2½ per cent.

115. *To Mr. Cook.*—In regard to typewriters, we were paying as high as £20 for the best machines; recently, however, it was ascertained that the Commonwealth Tender Board had a very satisfactory arrangement with Chartres Proprietary Limited in America for the supply of typewriters. At our suggestion, and with the consent of the Commonwealth Tender Board, we make our purchases through that body, and now land the machines for about £19 each. We make it a practice to exchange views with the Tender Boards of the States, particularly by exchange of gazetted contracts and conditions. I have been to Sydney and to Adelaide in connexion with this matter, and have made reports to the Government. It would be wise to have annual conferences between the principal officers of the various States Supply and Tender Boards for the discussion of matters of mutual interest. The Victorian Government has adopted the principle of preference first to articles of Australian manufacture, and, secondly, to goods of British manufacture. In operation the Board has recommended a preference up to 15 per cent. to the Australian manufacturers. The Inspector of Stores is really an inspector of officers in charge of stores, and he has very definite duties. If, in his opinion, the goods are not up to standard quality he reports immediately to the heads of Departments concerned.

116. *To Senator Reid.*—An officer in each Department is appointed under the regulations as the officer in charge of stores and material. He is responsible for the proper custody and receipt of all stores. In the event of any dispute between this officer and a contractor as to quality of goods supplied, the latter has the right to ask for a Board of Survey to determine the matter. If the officer is lax in his duties he is liable to censure by the Minister and also by the Board. The Tender Board never had occasion to censure any officer for dereliction of duty in this connexion.

117. *To Senator Lynch.*—The Board receives tenders, and for all contracts above £100 in value, the Board's recommendation for the acceptance must have the approval of the Treasurer. Very rarely does the Treasurer fail to endorse the recommendation. The decisions of the Board have never been successfully challenged in Parliament. References have been made in the House and questions asked from time to time, but in all cases we have been asked to furnish satisfactory reasons for any action taken.

118. *To the Chairman.*—The Inspector of Stores Officers is appointed from within the Department by the Public Service Commissioner. He is perfectly independent of the Tender Board, but has no voice or say in its proceedings, although he is frequently consulted in the compilation of schedules because of his intimate knowledge of departmental requirements. Strictly speaking, he is not an Inspector of Stores, but is an Inspector of Officers in charge of stores and, as such, he examines and reports upon their methods. It would be his duty to report to the Tender Board on excess stores so that the Board could know, when calling tenders for fresh supplies, that there was an excess of certain lines in the Departments. He is engaged all the year round upon his duties.

F.13583.5

119. *To Mr. Cook.*—The Board meets once a week within office-hours. The Government Printer is the Chairman, and the other officers are the Inspector-General of the Insane, the Under-Secretary, the Engineer in charge of Ports and Harbors, and myself.

(Taken at Melbourne:)

WEDNESDAY, 12TH NOVEMBER, 1923.

Present:

Mr. GREGORY, Chairman,

Senator Barnes.

Mr. COOK.

Senator Reid

Mr. MATHEWS.

Mr. BLAKELEY

William Gordon Murchison, Managing Director Cooperative Estates Limited, Hobart, sworn and examined.

120. *To the Chairman.*—My company is concerned chiefly with the subdivision of property, and to a lesser extent with building operations. We hold two or three patents for concrete construction in respect of buildings, kerbs, and surface drains. We have erected a number of houses in Hobart, also at Belmont (Sydney), Brighton and Sunshine (Melbourne). The outstanding feature of our system, which is protected by letters patent, is the use of angle steel uprights and steel shutters, which, combined, form the mould. The uprights and sheets are so fabricated as to be adjustable to any shape or design of house, and the walls may be either hollow or solid. Included in the system is a device known as the cavity box, or, as it is called in America, the "core," for the construction of hollow concrete walls. These steel clamps fit in a series, and may be withdrawn with perfect ease. There are also brackets attached to the steel framework for the fixing of scaffolding, thus enabling the workmen to pour in the concrete as the building rises. The sheets are moved up 2 feet each day, so that an ordinary cottage of 10-ft walls is built in five days. The foundations and chimneys, under our system of construction, form part of the entire building, which when finished may be described as monolithic in character. The sum of £25 per house will cover interest and depreciation on the steel plant, which are 6 inches in thickness, made up of double 2½ in. continuous operation. The first cost of the plant is about £500. Buildings constructed under this system are practically everlasting, and insure the maximum of comfort, either in winter or summer. The concrete mixing is five parts of stone or crushed gravel, three parts of sand, and one part of Portland cement. The most popular finish for the outside walls is rough-cast. Inside, the walls are sufficiently true and smooth to require only a final coat of plaster. The external walls are 6 inches in thickness, made up of double 2½ in. concrete with 1½-in. cavity, and internal walls are 3 inches solid concrete. Under our system buildings of any size and type may be erected. We find that No. 8 gauge wire is sufficient horizontal reinforcement, with 1-in. vertical steel rods. If desired, the chimneys may be of brick. Some architects specify brick chimneys for the sake of appearance. The door jambs are built in, a false door jamb being provided with spring head nails projecting into the concrete. We have erected a considerable number of buildings in the three States mentioned. One was a motor garage of three stories, with concrete floors. In that case the external walls were 3 inches thick, and I think, the floors were 4½ inches thick, very heavily reinforced with 1-in. steel rods. The girders, likewise, were of concrete. For the War Service Homes Department we erected at Belmont, Sydney, fifteen complete cottages, and sixty-four concrete

shells. Mr. John Sulman, Consulting Architect, submitted the following report to the company:—

Warrung-street, McMahons Point, Sydney.
20th September, 1921.

Manager, Co-operative Estates Ltd, 63 Pitt-street, Sydney.
Dear Sir,

Having made a careful examination of the reinforced concrete cottages now in course of erection at Belmore for the War Service Homes Commission, on the Wilson patent system, I have the honour to state that in my opinion they are stronger, more durable and weatherproof and easier to erect than the ordinary brick cottage built with 12-in. hollow walls.

The system adopted—that of using steel shuttering supported by steel uprights—appears to me to be simple and cheap, and I believe that it will be found to meet all the ordinary requirements of house building. From my inspection of the houses in question, I am satisfied that by the use of this system houses are being erected which contain every feature considered essential in modern house construction.

By the use of an ingeniously contrived cavity box, a continuous and unbroken cavity is secured in all external walls from the dampcourse to within 2 inches of the under-side of the eaves. The top edges of the cavity box are a proper dampcourse, flashings to gills and heads to frames, and wire wall ties having a kink in the centre, make the building absolutely weatherproof, and is, in my opinion, equal or superior to the best class of cavity work being carried out.

The walls of the cottages are constructed of concrete moulded into monolithic walls of a thickness of 6 inches externally (3½ inches each side and a 1½-in. steel rod) and 3 inches internally, reinforced vertically by 3-in. steel rods and horizontally by 1½-in. steel rods, the latter being placed in wire wall ties which run in a structure which is unbreakable in its stability. Even with a clay foundation, cracks or weaknesses are not to be feared.

I am of opinion that coke breeze concrete could be satisfactorily used provided the walls were made 3 inches in thickness.

The rapidity of erection, i.e., seven days for the erection of the actual walls or ten days from foundation to chimney caps, and the utilization of unskilled labour are important advantages. The steel shuttering and uprights cost less than the Wilson patent are strong, well made, and easily put together and shifted. With ordinary care no honeycombing is apparent, so that a very thin coat of rough-cast outside and a setting coat of plaster internally is all that is needed to finish the walls.

A further advantage is the economy effected by the saving of a foot each way in the area of the ground covered and in roofing costs.

The fixing of doors, windows, and fittings is simple and effective, involving much less labour than the ordinary plugging of brick joints.

The Wilson patent system, to my mind, the most practical, safe, and economical of all methods of house construction which has come under my notice, and if the saving of £50 per five-roomed cottage stated to have been effected is correct (as I see no reason why such saving should not easily be possible), then it will become an important factor in solving the present housing problem.

Yours faithfully,
(Sgd.) JOHN SULMAN,
Consulting Architect.

Mr. Sulman's report was really an endorsement of a minute by Captain Earle, then Supervising Engineer for the War Service Homes Commission, to the War Service Homes Commissioner. I also submit the following statement, being a comparison of costs, brick and concrete, of a cottage erected for the War Service Homes Commission at Belmore. The figures, which are official, were supplied by the Deputy Commissioner for War Service Homes, and show that the difference in favour of concrete as against brick was 251 17s. 7d. The details are:—

CONCRETE.

| | £ | s. | d. |
|---|-----|----|----|
| 37½ tons 2-in. blue metal, 12s. 1d. per ton | 23 | 13 | 2 |
| 20 tons sand, 6s. per ton | 11 | 14 | 2 |
| 12½ bags cement, 6d. per bag | 33 | 10 | 0 |
| 3 tons dampcourse, 19s. per roll | 1 | 15 | 0 |
| 1 cwt. 8-gauge galvanized wire, 25s. per cwt. | 0 | 7 | 3 |
| 1 cwt. 3-in. steel rods, 43s. per cwt. | 2 | 3 | 0 |
| 22 tons bunting, 10s. 3d. per ton | 0 | 24 | 6 |
| 10 bags lime, 3s. 6d. per bag | 0 | 10 | 0 |
| 12 air louvres, 9 x 6, 10s. 1d. per dozen | 0 | 10 | 10 |
| 14 air bricks, 9 x 6, 6s. 10d. per dozen | 0 | 8 | 0 |
| Total labour, including excavation and fixing | 70 | 10 | 4 |
| Interest and depreciation on plant | 10 | 0 | 0 |
| Royalty on plant | 10 | 0 | 0 |
| | 167 | 7 | 5 |

| BRICK. | | | |
|---|-----|----|---|
| 16 cubic yards 23 cubic feet excavation | 4 | 4 | 0 |
| 3 cubic yards 3 cubic feet concrete floors, 4-in. thick, 32s. | 5 | 18 | 3 |
| 1 cubic yard 11 cubic feet concrete lintels, 6s. | 3 | 14 | 3 |
| 224 cubic feet reinforcement, 4-in. bars, 43s. ... | 3 | 0 | 3 |
| BRICKWORK. | | | |
| 10,237 bricks, common | 93 | 15 | 6 |
| 175 bricks, floor piers | 11 | 3 | 7 |
| 108 bricks, chimneys | 56 | 16 | 7 |
| 23,733 bricks, 2s. 6d. per 1,000 | 14 | 0 | 0 |
| 1,841 bricks, O.K., 15s. per 1,000 | 10 | 10 | 0 |
| Labour, bricklayers, 4s. per day | 0 | 10 | 0 |
| 25 cubic yards sand, 6s. | 11 | 5 | 0 |
| 30 bags lime, 9s. 4d. | 14 | 0 | 0 |
| 10 bags cement, 5s. 6d. | 2 | 15 | 0 |
| 332 feet dampcourse, 3s. 6d. per roll | 0 | 12 | 0 |
| 1,770 feet brick, 2½-in. galvanized, 17s. 1d. per roll | 1 | 9 | 9 |
| 30 wall ties, No. 8s. galvanized, 5s. per 1,000 | 2 | 6 | 0 |
| 12 air louvres, 9 x 6 T.C., 6s. 10d. per dozen | 0 | 17 | 0 |
| 14 air bricks, 9 x 6 T.C., 6s. 10d. per dozen | 0 | 8 | 0 |
| Carpenters' labour on floor, timber, door, and window frames | 6 | 5 | 5 |
| | 318 | 18 | 0 |

NOTE.—Cartage included in prices. Finishing trades common to both have been omitted. If included, the advantage would still be with concrete, as the internal plastering is cheaper by reason of no rendering coat being required and the overall span of the roof is 1 foot less in each direction, due to the lesser thickness of the walls.

That building contained 10 1½ squares. The plan, which I produce, shows the dimensions of the respective rooms thus—Living room, 10 ft. 6 in. x 15 feet; No. 1 bedroom, 14 ft. 6 in. x 10 ft. 6 in.; No. 2 bedroom, 11 feet x 9 ft. 6 in.; kitchen, 10 ft. 6 in. x 10 ft.; laundry, 8 ft. 7 in. x 7 ft.; bathroom, 11 ft. 6 in. x 7 ft. 5 in.; verandah, 6 feet wide; passage, 3 ft. 6 in.; height of walls, 10 feet.

121. To Mr. Cook.—Some years ago, when we started building in Hobart, we were able to build in concrete as cheaply as other contractors could build in timber. Prices for materials have gone up considerably since then, but the price of timber has also increased.

122. To the Chairman.—Just at the moment our plant in Melbourne is not in operation, owing to a difficulty we are experiencing with some of the municipal councils, which seem inclined to insist upon concrete external walls being the same thickness as brick. I think the difficulty is being got over, and we hope soon to have a building under construction either at Canterbury or Cambewell. I may mention that Mr. Leith, of the State Savings Bank, has spoken very favourably of our work. He supervised the construction of our concrete houses at Sunshine. We prefer not to contract for the erection of a complete home. As a matter of fact, we have only gone into the building business in order to put our patents on the market. Our principal line is property developing, but it would seem that we shall be obliged to extend our building operations. My object in giving evidence before the Committee is to show that by our process the cost of Government buildings at Laverton and elsewhere may be cheapened. There need be no difficulty whatever in connexion with gas fittings, electric light conduits, outlet pipes, and sewerage pipes. All these may be provided for during construction. I should say that, if crushed stone is available within reasonably easy distance of Laverton, the cottages and other buildings proposed to be erected there may be constructed in concrete 25 per cent. below the estimated cost in brick. I am referring, of course, only to the concrete and brick portions of any building. The cost of foundations would probably be the same in either case, although for concrete, the walls being thinner, the foundations need not be so wide.

123. To Mr. Mathews.—Mr. Leith supervised the construction of our houses at Sunshine, and introduced me to Mr. Emery, the Inspector-General of the Savings Bank Department, who raised the question whether it would be possible for us to start operations in Melbourne, so that we could tender for buildings being erected by the Savings Bank authorities. As I was discussing the matter with him, Sir James McCay, who had seen our work at Belmore, came into the room, and when Mr. Emery asked him what he thought of our method of construction, he replied, "Oh, you may remember that some time ago I told you what a splendid system it is." Our difficulty in connexion with it! commencing building operations in Melbourne is largely one of finance. The cottages which we built at Belmore were constructed on the group system, and so far as I have been able to ascertain, they are quite satisfactory. I happened to be passing one of the dwellings recently with a gentleman who is interested in what we are doing. Seeing a lady standing in front of the house, I asked her how she liked her concrete home, and she replied that she liked it much better than a brick house. There has been a lull in our operations lately, due to a difficulty with the War Service Homes Department. We were induced to go to Sydney by the Commission to demonstrate our claim that we could save the Commission £1,000,000 on its building programme, this view being based upon contracts which we had taken in Hobart. Our arrangement originally was to build only the shells of the cottages, but we were prevailed upon to contract for fifteen complete cottages on the understanding that arrangements for the supply of materials would be facilitated. Unfortunately we were hung up in a number of ways, with the result that the fifteen houses cost us more than £50,000 above the amount of our contract. This landed us in financial difficulties. The cottages at Sunshine were built for Mr. H. V. McKay. In that case we contracted only for the erection of the concrete shells, Mr. McKay being responsible for all the finishing work. Those houses were built about twelve months ago.

124. To Mr. Cook.—The upkeep of the concrete house is almost negligible, and because they are monolithic in character, they are practically everlasting. Cement houses built on our system are cool in summer and cosy in winter. We have not been building in Tasmania for some time now. I should imagine that we could erect a concrete house there for about the same price as a timber house, but of course its life would be as 100 to 1 compared with timber. We can build to any design. There need be no restriction on the part of the architect. As a matter of fact, a number of cottages were built by the Electrolytic Zinc Company, which intended to have the buildings erected in brick, and they were so designed. They had no difficulty whatever in carrying it out under our system. In a variety of ways we are encountering almost insuperable difficulties due, I believe, to certain vested interests opposed to our method of construction. In connexion with our work for the War Service Homes Commission, in Sydney, we came to the conclusion that certain influences were insidiously but definitely operating against us, doing everything possible to make our position difficult. But everything is in the dark. We are not able to say definitely from what quarter this opposition comes. From information I have received, I understand that there is an ample supply of gravel and sand in close proximity to Canberra, and this being so I should say that it would be possible to build suitable concrete cottages there certainly as cheap, if not cheaper than timber houses.

125. To Mr. Blakely.—I cannot say at this juncture if my company will tender for the erection of cottages at the Capital site. This will depend upon the reply which I expect to receive from the Acting Prime Minister in connexion with a request relating to finance.

126. To Senator Reid.—It is about twelve years since we started operations in Tasmania. The houses built then are standing splendidly, although the first few

erected have shown a slight tendency to crack over the doors and windows, but not more than would be noticed in a brick house. Profting by experience, we have strengthened the reinforcements in these particular places, and have eliminated the possibility of cracking. It would be possible within the first day or two to damage a concrete house, but after about a week you could drive a concrete wall with an iron rod, and it would ring like granite. Scientists claim that in twenty-five years concrete becomes 25 per cent. harder than the hardest flint. Any objection to a concrete house, owing to its colour or through its becoming dusty-looking, could be overcome by a cheap lime-wash. I cannot make a comparison as to relative costs of concrete and timber houses in any other State but Tasmania, but I should say that the ratio would be the same in all the States, and, as I have said, we estimate being able to build a concrete house as cheaply as any timber structure. Moreover, concrete is practically everlasting, and the maintenance is trifling. In the early days we used imported cement. It was then a question of using whatever cement was on the market. We find the Australian cement quite satisfactory. I should say that a concrete house, similar in design to the plan of the cottage now before the Committee, being one of the houses built at Belmore, could be erected at Laverton for £700. The buildings are usually finished in roughcast. A smooth face for the exterior walls would cost about £10 more. With our plant we are prepared to erect buildings to any height desired, and to any design

(Taken at Melbourne.)

TUESDAY, 25TH MARCH, 1924.

Present:

MR. GREGORY, Chairman;
SENATOR BARNES, Mr. COOK,
SENATOR LYNCH, Mr. MACKAY,
SENATOR REID, Mr. MATHEWS
MR. BLAKELY,

WING-COMMANDER STANLEY JAMES GOBLE, D.S.O., O.B.E., D.S.C., Chief of the Air Staff, recalled and further examined.

127. To the Chairman.—My Department has been making inquiries in regard to procuring a site for the establishment of an aircraft dépôt further away from the noxious trade area reserved by the Victorian Government. As to whether it would be dangerous to have the establishment on the old site, I can be guided only by the medical view. A good number of noxious trades are now located in the Footscray district, which is a populous residential suburb. Having in view the medical evidence, which is of an expert character, I prefer to have a new site rather than persevere with the present site. In seeking a new site, it is necessary to look for a good open space on the main line and as near a main road as possible within a convenient distance of Point Cook. I think the surface of the new site is better than that of the present site: it is more easily drained and is better grassed. I consider that it will be quite suitable for our purpose after a portion of the irrigation channel has been covered. I believe that the cost of that work will be counterbalanced by the saving in cost which it will be necessary to incur in connexion with the severage. The estimate of that work I believe to be approximately £3,000. About 200 acres will be ample for the establishment. That is a greater area than is contained in the present site. Having a larger area makes it safer and provides room for expansion. The works officer considers that the triangular piece of land shown on the plan will facilitate the lay-out

and will render it possible to keep the married quarters away from the single quarters. There is no obstruction in the way of bringing a railway siding into the property. The distance from this establishment to Point Cook will, of course, be greater than it would be from the present site. In the summer time, when we can use the back road, the distance will be 4 or 5 miles. Not being a first class road, it will not be possible to use it in winter. The length of that road is about 44 miles. I do not think it likely that we will recommend substantial improvement to that road for some time to come, because the Geelong-road is such an excellent one. At the present time the road from the Geelong-road to Point Cook is being completely rebuilt. There will be a good deal of communication by road between the two establishments. The amount of traffic will depend entirely on the activities at Point Cook. If we have a very small Air Force there will not be such a great deal; but if the Air Force extends and we have a large training programme, the traffic between the dépôt and Point Cook will increase considerably. For the economic handling of stores, one site would be equally as good as the other. The proposed site offers a larger amount of space for flying purposes than the present site. In regard to the water supply, obviously an increased length of water main—nearly 3 miles—will be necessary. On the other hand, we will be nearer to the sewerage, and that will represent a reduction in cost on that item. Electric power, I think, will cost more, because we will be further away from the source of supply. The question of bringing the power from Werribee and doing away with the necessity for transforming it will be carefully considered, in order to avoid the possibility of incurring excessive expenditure. The Committee has my assurance that every care has been taken in selecting the proposed site. I prefer the old site at Laverton; but, in view of the medical evidence, I consider this is the best site that could be obtained. No other area in the locality is as good as this one. We have conducted an examination from the vicinity of Williamstown to Geelong, and, next to Laverton, this is the best site available.

128. *To Senator Lynch.*—The relationship between this establishment and Point Cook is similar to that which exists between a retail establishment and a warehouse. The dépôt will be the warehouse and Point Cook is the flying training school. The proposed site is not quite as convenient as the old site. I understand that the State Government declined to give a guarantee that noxious trades would not be established down there. Were that guarantee to be given, I should recommend building on the old site. Because of the unwillingness of the State Government to give that guarantee, I should not advocate the removal of this establishment to New South Wales or some other State. I have never had experience of the State having hindered our operations in the past. It is not for the Air Board to tell a State Government what it should do. They have had this area reserved for noxious trades for a good many years.

129. *To Mr. Mackay.*—The area proposed to be acquired comprises about 200 acres. There is still 200 acres left to the owner of the property. The whole block was offered, including the house, but we did not require that area of land. I do not consider it to be a disadvantage to have a road on three sides. There is ample room available and plenty of open country in the vicinity. It will be necessary to fence in portion of the site with a wirefence to keep cattle off the land. A portion of the irrigation channel will have to be covered because our buildings will be erected right alongside it. Goods coming from the railway will have to pass over the channel. The general opinion of the engineers and medical officers is that it is wiser to cover port on the channel. The old site contains too much rock on the surface. It is an advantage to have a soft, grassy surface, as long as it is firm and well-drained. I do not

consider that the soil is of such a character that it will be found to be too soft in wet weather. It looks to me to be particularly good soil, and very well drained. I do not think the proposed site will require much preparation; it is quite good in its present state.

130. *To Mr. Cook.*—We have not taken any action to induce the State Government to alter their attitude. I understand that action was taken by the Parliamentary Works Committee. The Commonwealth Government wrote to the State Government, and received the reply that the necessary guarantee would not be given. If there is any possibility of inducing the State Government to adopt a different attitude, an endeavour ought to be made in that direction. The old site is slightly better than the proposed site on the score of convenience, as the distance from it to Point Cook is 5 miles. The extra distance from the proposed site is from 24 to 3 miles. I do not think that is a vital consideration. Obviously, the cost of road transport will be a little greater, and there will be an additional cost incurred in establishing the new site. We have bought the old site, but we may be able to sell it at a profit. There is also the consideration that it is advisable to have the habitation somewhere near an established centre. The proposed site is between Werribee and Laverton, 3 miles from the former station. The old site is half a mile from the Laverton station. The total area of the land from which it is proposed to acquire a portion for this site is 380 acres. I have a fairly good idea of the value of land in the district. I think that too much is being asked for this 200 acres; we should be able to get it for from £18 to £20 per acre. A sum of £3,524 was paid for the old site in 1921. I should think it would be possible to sell it without loss.

131. *To Senator Reid.*—The smoke and fumes would have a detrimental effect on the men while flying. The objection to establishing an aerodrome in a noxious trade district has apparently been raised merely on behalf of those who would have to live in the district. Our Air Force engineer, in conjunction with officers from the Works and Railways Department, is responsible for the lay-out of the establishment.

132. *To Mr. Mathews.*—Water, not sewage, flows along the channel I referred to.

133. *To Senator Barnes.*—The proposed site at present appears to be quite ready for use as a landing-ground. I saw it the other day in hot weather, and it struck me as being quite a good plot. I think it has a better surface than that of Point Cook aerodrome. We have had to grass the site at Point Cook, but I do not think it will be necessary to take such action in connexion with this site. In any case, the sowing of grass would not be costly. Re-grading, or anything of that nature, would not be necessary. It is ideal land for flying purposes. My only objection to it is on the ground of the extra cost that will be necessary.

The witness withdrew.

Arthur Pereira, Assistant Surveyor-General, Department of Home and Territories, sworn and examined.

134. *To the Chairman.*—I was connected with the negotiations for the purchase of an area of land to be utilized in establishing an aerodrome dépôt at Laverton. The area purchased comprised 150 acres—150 acres from Mrs. Tarren and 10 acres from Mr. J. Maher. The compensation paid to Mrs. Tarren was £1,500; and to the State, for their interest in the same property, £1,094 5s. 10d. The latter figure was made up of £1,069 5s. 9d., which was owing to the State, plus interest from the date of acquisition, £21 0s. 1d., plus Crown grant fee £1 6s., plus insurance for £3 10s. The amount paid to Mr. Maher was £930. There were a residence and other improvements on the land. The purchase price for the whole area worked out at about £225 per acre, unimproved value, while for Mrs. Tarren's interest it amounted to about £10 an acre. About a

fortnight ago, I was asked to investigate another area. Then, early last week, I was asked to obtain information regarding an area which was part of the area originally indicated near Werribee. I obtained the information hurriedly. The valuation was made by an expert valuer in the district. I think the value of the land itself is in the vicinity of £2,500 or £3,000. The value varies for different portions. I have been informed that the portion which you have under review is the better portion. The value I have given is straight out unimproved value, not taking into consideration the residence or the question of severance. Severance is a very important factor. Allotment 7 is owned by Carl Ernest Bernhardt and comprises an area of 161 acres 2 rods 24 perches. The adjoining block, 8, contains an area of 161 acres 0 rods 3 perches. This is owned by Minnie Bernhardt, and the two portions are being worked as one farm. I have been informed that in this district a man cannot make a living with 100 acres. Therefore, the State permitted Mr. Bernhardt to take one portion and his wife the adjoining portion. If only 123 acres were taken the greater portion of this man's livelihood would be taken from him. We have not taken any action to secure an option over this land; a preliminary investigation only has been made. I am taking action to have a thorough valuation made, and I expect to be furnished with it in the course of another week. This valuation is being made by a private valuer of high standing. In a case like this, I would prefer to have two valuations, because the officer who is dealing with the matter is a man who is engaged by the Land Tax Department, and I frequently find that an outside valuer who is not valuing for a Department places a different value upon a property.

135. *To Mr. Mackay.*—The triangular piece of land contains an area of 8 acres 3 rods 34 perches. Allotment D, which adjoins it—with the exception of the road which severs the two properties—is owned by Henry John Neal, of Newport, under a conveyance under the old law. Allotment B is owned by the same man under a certificate of title. If you take D and E away from Neal's property, you leave him with an area of 54 acres 3 rods 203 perches on the south-eastern side of the main road adjoining the railway property. In making a valuation, I would take into consideration the whole of the area. In making valuations, we value only the portion which it is proposed to acquire, because the residue may not have the same value. In a report which I furnished to the Works and Railways Department, I suggested that it would be far better to acquire the whole of the property owned by the Bernhardts. It has been suggested to me that the family were desirous of disposing of the property, but I have no direct evidence on this point. One hundred and sixty acres would be of no use to them. I have gleaned the information that if we acquired the whole of the property there would be a good possibility of getting rid of the residue, i.e., that portion not required by the Commonwealth, at a satisfactory figure to some one in the locality, not to earn a living of it but to run a few horses on it and do a little cultivating. My Department has not taken any steps to have the property placed under offer. I do not anticipate that the owners of the property have become acquainted with the investigations that are being made regarding it. Of course, if the Air Force or the Defence Department drive up to the door in a motor car to conduct the examination it gives the whole a show-away appearance.

136. *To Mr. Mathews.*—I always prefer to proceed in these matters in as quiet a manner as possible. 137. *To Mr. Mackay.*—If you ask for an option, you have to pay for it; otherwise, it has no legal value. There must be some cash consideration; it may be £5, or even £1. We do not make a practice of obtaining options. I have been acquiring postal properties and other properties for the last eighteen months, and I have not yet obtained an option over

any. Owners usually ask a considerably higher price from the Government than from private persons.

138. *To Mr. Cook.*—In negotiating for the purchase of the present site, we made inquiries regarding the possibility of establishing noxious trades in the area. Mr. Warrick informs me that he advised the Defence Department in that regard. I was under the impression that they were fully aware of the position. I do not think that that aspect of the matter had anything to do with us. We made the Department aware of the position, and we were asked to go ahead and complete the acquisition. I do not see that the establishment of noxious trades has any material effect. It seems to me to be a matter for the Defence Department. They know the use to which the property is to be put. Being a store depot, we thought it would not matter if a noxious trade area adjoined it. Frequently we have been able to make a satisfactory deal well beneath the figure stipulated. There have been occasions when it has been necessary to refer the matter back and tell the Department that it is considered impossible to continue negotiations on the basis of the amount set aside for the acquisition. In regard to the proposed site, I have written to the Department of Health and asked for information in relation to the establishment of a noxious trades area. I have not yet received a reply. In making the valuations we value on the present use of the land. If you consider the matter as a sub-divisional proposition, the value has to be considerably increased. That will be a possible view which the owner of the property will take should we compulsorily acquire. I am opposed to compulsory acquisition. I do not think that an option should be obtained before an inspection. If we took options on everything which we are called upon to investigate, I would be taking them all day. I have had advice from the Crown that an option is not worth the paper it is written on, unless there is a cash consideration.

139. *To Senator Reid.*—If you take allotments D and E from the present owner, he will be left with a very small area which he cannot work. I think that it would be better to acquire the whole of allotments 7 and 8. You would thus get over the question of severance and depreciation of the residue. The Defence Department originally asked me to take steps with regard to allotments 7, 8, and D. If the whole area were purchased, and the portion not required were sold, it would be a good business proposition. The question of depreciation and severance in this case is going to be one of some difficulty.

140. *To Mr. Mathews.*—If you take 123 acres 3 rods, you will leave something which is of little use to the owner. My suggestion is that the Government should buy the lot and dispose of that which they do not require.

141. *To Senator Lynch.*—The total area proposed to be acquired consists of 184 acres 0 rods 24 perches—123 acres 3 rods 0 perches from one owner and 60 acres 1 rod 28 perches from another owner—leaving to both owners land which will be of little use to them. The question of severance will arise in both cases. The biggest difficulty will be encountered in regard to allotment 8, because you are absolutely taking away the livelihood of the owner. The unimproved value varies between £15 and £16. Irrespective of the question of severance, but including improvements amounting to £1,200, I should say the purchase price will be in the vicinity of £4,100. This value is based on the land as a farming proposition, not on a sub-divisional basis. If you take the sub-divisional value, there will be a sum in excess of that—probably double the amount. I told the Works and Railways Department that severance would possibly represent another £1,000. These valuations are subject to amendment when the values have had a thorough look at the property. He made only a tentative valuation; he could not tell me the number of rooms in the house or the amount of cultivation that has been done. He is obtaining all this information for me.

If these values are borne out by the check valuation, you should get it for £16 or £17 per acre throughout. When negotiations for the purchase of the property fail, we take steps to compulsorily acquire it. We make our statutory offer of the value we are prepared to give. If the owner is not satisfied, it remains for him to take us to Court. In such cases as this there has always been a tendency to ask about three times the value. Isolated land without improvements in this district, I think, could be rented for grazing purposes at £1 or 2s. per acre. In purchasing the present site, the question of severance did not arise. In addition to the payment to Mrs. Tarran, the Commonwealth agreed to certain conditions. We were to erect the dividing fence, give right of access along the railway line through our property, and place a 4-inch water pipe up to their boundary connecting with a trough. We allowed them to cultivate 15 acres of the land which we were acquiring, and got a crop off it. The condition with regard to road access was waived on the Commonwealth paying the sum of £50, and that with regard to water supply was cancelled on the Commonwealth undertaking to transfer the windmill and fittings, valued at £20, from Mr. Maher's property to that of Mrs. Tarran.

142. *To the Chairman.*—If the Committee recommended that allotments 7 and 8 should be acquired, I do not think there would be any difficulty in resuming from allotment D an area sufficient to allow of the continuation of the main road along the railway line into the property. Mr. Neal is a contractor at Williamstown. He is not deriving his livelihood from allotment D. Therefore, I think he would be quite willing to sell a piece of land for that purpose; it would benefit his property in the future for subdivisional purposes. We have power to resume for roads, drainage, or any other purpose.

The witness withdrew.
The Committee adjourned

(Taken at Melbourne.)

MONDAY, 31st MARCH, 1924.

Present:

MR. GREGORY, Chairman;

MR. MACKAY,

SENATOR REID, MR. JACKSON, MR. MACKAY,
MR. JACKSON, MR. MATHews.

THOMAS HILL, Chief Engineer, Department of Works
and Railways, recalled and further examined.

143. *To the Chairman.*—I am aware that since the first reference concerning an Aircraft Dépôt at Laverton was submitted to the Committee, a further proposal has been made to establish the dépôt at a new site. The estimates submitted in the amended proposal were prepared by me. Following on the representations of the Committee, as submitted to the Minister for Works and Railways on the 1st December, 1923, a letter, dated 8th December, 1923, was written by the Prime Minister's Department to the Premier of Victoria, as follows—

I desire to inform you that the Federal Parliamentary Standing Committee on Public Works is investigating a proposal to establish a large Aircraft Dépôt at Laverton, Victoria, involving an expenditure of about £300,000 for buildings and engineering services, and providing accommodation for about 300 persons. The Committee understands that certain areas adjacent to the proposed dépôt have been under consideration by your Government as areas reserved for noxious trades, and asks, in connexion with their deliberations, whether any assurance can be given that it will be rendered impossible for any noxious trades to be located within a 3 mile radius of the Aircraft

Dépôt, as evidence has been given that the proximity of certain noxious trades would be injurious to the health and comfort of those employed at the dépôt.

This reply, dated the 19th December, was received from the Premier of Victoria—

With reference to your letter of the 8th inst., I desire to inform you that a site has been reserved at Laverton as a noxious trade area, and that such site is within 3 miles of the position where it is understood that the Aircraft Dépôt is to be established. I regret that no assurance can be given that the reserved area will not be used for noxious trade purposes.

A further personal reference has now been made to the Government of Victoria, and, though this morning a definite decision had not been arrived at, it is understood that there will be no departure from the decision contained in their letter.

144. *To Mr. Mathews.*—A discrimination of noxious trades was not considered in this correspondence. The question was approached from the point of view of whether it was possible to remove the noxious trade area, say a distance of 2 or 3 miles, away from the suggested Aircraft Dépôt site. The Committee's letter distinctly suggests that the noxious trade area should be moved 2 or 3 miles away from the Aircraft Dépôt, so that the question of what trades were noxious was not discussed. It was a question of whether another site could be obtained for the noxious trade area. One sees the difficulty that the State Government is up against. That area is very well situated on the main line from Melbourne to Geelong, or on the suburban line from Melbourne to Werribee. To move the site 3 miles distant would mean the construction of a loop line to the site, which would be very disadvantageous. It is difficult to ask the State to do such a thing. However, at the request of the Committee, the State Government has been approached, and, so far, I cannot see any possibility of gaining their consent to alter the site of the noxious trade area.

145. *To the Chairman.*—In company with the Defence officers and the Chief Architect, I inspected the site. I have here a tentative plan of Hopper's Hill, showing the site. It will be noticed that the land is divided into blocks, Nos. 7, 8, and D. I am aware that it is proposed to acquire a triangular piece of land and part of block 8, which is very low-lying land. It would be quite a feasible suggestion to purchase blocks 7 and 8, and to make arrangements for a roadway through block No. D, continuing the Geelong roadway resumption, and thus give direct access to block No. 8. It must be remembered that the desire to place this proposal before the Committee was very urgent, and that necessarily the detail and laying out of the site has not been thoroughly considered. The proposal principally concerned the site, and not the various details. There is full power to resume land for roads as well as for defence purposes, and no difficulty would be experienced in that respect. If block No. D were not wholly purchased, then sufficient of it could be obtained to give road access. Possibly it might be arranged to place the road along the railway line, but I hardly think that course would be approved of, as the reserve along the line is not too large even for railway purposes. A clear roadway connecting with the Geelong road is necessary in order to have rapid communication with Point Cook in case of war. The sum of £3,000, set out in the Parliamentary Estimates as required for covering the channel, could, I think, be reduced to some extent, but it would still be necessary to cover the channel in allotment No. 8 on account of requiring access from the railway to the site. The channel comes between the railway and the site. Although an amount of £3,000 is put down for the construction of the whole length of the channel, that again is a tentative estimate. I am in touch with the State Rivers and Water Supply Department with a view to reducing the amount, but that will take some little time to consider,

as the full purpose of that channel will have to be taken into account. For instance, it may be necessary to enlarge the channel to command more area. It is not possible at this stage to say what will be the definite size of the pipe. On the other hand, there is a considerable quantity of stone out of excavations that could be used to advantage; that is, in the banks. So I think £3,000 may be taken as full value, with a possibility of reduction. The channel could be constructed along the land proposed to be resumed for a roadway. In allotment No. D a road could be constructed, and the channel laid between the road and the railway, but in allotment No. 8 the channel would require to be covered to give railway access. When making the inspection with the military officers, they stressed the point that they were desirous of lowering the banks and making them as flat as possible, because the site was to be a training ground, and they wanted, as far as possible, a smooth surface. This training ground would not need to be of such a character as Point Cook, where permanent forces are established. In this case the ground will be used for the militia in its initial stages, and, therefore, in the preliminary training great care is needed to have no obstruction on the ground. It seems feasible that, with 220 acres or more, the area reserved for private use should be in proximity to the channel, and the training ground located elsewhere on the site, but it would mean acquiring considerably more area. It might cost as much to cover that portion of the channel through Block No. 8 as it would to acquire the extra area, but this point has not yet been thoroughly thrashed out. The expenditure of £10,000 on water mains is based on 3 miles of 6-in. pipe. The water supply is not handy, and it would have to be extended from the present junction of the Point Cook-road with the main line of railway. The only supply of water at Werribee is obtained from the Board of Works, most of which proceeds to the sewerage farm. That supply is already over-taxed, and the Board of Works are not prepared to increase it.

146. *To Mr. Jackson.*—It is true that there was to be an increased water supply at the Laverton site, but the present suggestion is an extension of the proposals which were originally placed before the Committee.

146. *To the Chairman.*—At present we are rather in favour of extending the electric main from the junction of the Point Cook-road with the railway near Laverton station. To take a connexion from the electric main proceeding right round by way of Point Cook and Werribee would subject the site to the danger of cut-offs. As the distance is a matter of a few hundred pounds, it appears advisable to take the more direct branch along the Geelong-road for 3 miles. The danger of a cut-off would be serious if the dept were in full training, as the trainees would lose time and the shops would be shut down. There would be no necessity to install a further transformer over and above what was suggested in the first proposal. A transformer would be required at Werribee, as 3 miles is too great a distance for low-tension distribution. It would require to be a high-tension main from Werribee, and then transformed down at the site. I think that the estimates submitted by the Minister will stand good to-day, the only alteration they have taken into account being £1,500 for reduction in the length of sewerage pipe. I think that the new site will be, if anything, cheaper to build upon, as its nearness to Werribee will assist in the labour, and the location is not so stony. Included in the expenditure on the

first site for clearing it of stones was an item of £1,000 that would not be required on the new site. It is hard to state a monetary value, but I think there would be a considerable saving. It is a good site, and much better in all particulars than that previously suggested. It is preferable for both building and draining, as the slopes are better. Of course, the distance of the new site from Point Cook, as compared with the previous site, is increased by 3 miles, the increase being from 5 to 8 miles. A cross road could be constructed, which will eventually bring the new site within the same distance of Point Cook as the original site. This road has not yet been suggested, but we have our eyes on the proposal, the cost of which would be £4,500 per mile, totalling £13,500 for 3 miles of construction. The rest of the road is good, and joins the road at present being made from Point Cook to Laverton, on which road we are now expending £20,000.

147. *To Senator Reid.*—I am great in favour of the new site. The question of deciding which blocks of land should be acquired requires careful thought. Some of the land has been under irrigation for lucerne, and, of course, the irrigable portion may be of a much higher value than the remainder. A lot of the land proposed to be purchased is not irrigable, but is very good land situated above the level of the channel. I should not favour purchasing the land with the idea of disposing of it if not required. We should limit our operations to the purchase of actual requirements, unless it can be shown that there is a distinct monetary advantage in acquiring additional land. There is an indisposition on the part of the Commonwealth to deal in land. It is really a question of whether we should pay for severance more than the amount for which we could buy the whole block. There is a road along the western boundary of block No. 7, and if the whole of that block were acquired it will mean a roadway completely round the whole of the area. The present road to the north, and the one proposed this afternoon—a direct connexion with the Geelong-Werribee road—would meet the case. Still, if blocks Nos. 7 and 8 were acquired there would be roads to the north, west, and south-west of the triangular block. Portion of block No. 8, to the south-west, bears traces of having been irrigated. In any case, it is capable of irrigation. Portion of No. D, to the north-east, also seems to have been irrigated. The channel is not for the purpose of serving these particular blocks, but goes a long way to the north-east, commanding a very considerable area. Therefore, we must provide a pipe large enough to carry the water for irrigating the country to the north-east, in the Werribee direction, for stock and domestic purposes. It is possible that we might decide to deviate the channel. The State Rivers and Water Supply Department are considering two suggestions, one to deviate to the south and the other to the north.

148. *To Mr. Mackay.*—I do not think that there would be any objection, from the public point of view, to the construction of roads practically surrounding the proposed site, especially in view of the size of the area to be acquired, viz., 170 acres. I do not think there can be any objection from any point of view. Consideration has been given to the main sewer—the outfall sewer—and that is far enough away to give no cause for complaint. The fact that the sewerage farm is within 6 miles of the area has also been considered. I cannot imagine any obvious complaints against the site.

The Committee adjourned.